Maintenance Alarms Reference

555-245-102
Issue 1
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Notice

Every effort was made to ensure that the information in this document was complete and accurate at the time of printing. However, information is subject to change.

Warranty

Avaya Inc. provides a limited warranty on this product. Refer to your sales agreement to establish the terms of the limited warranty. In addition, Avaya's standard warranty language as well as information regarding support for this product, while under warranty, is available through the following Web site: http://www.avaya.com/support.

Preventing Toll Fraud

"Toll fraud" is the unauthorized use of your telecommunications system by an unauthorized party (for example, a person who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf). Be aware that there may be a risk of toll fraud associated with your system and that, if toll fraud occurs, it can result in substantial additional charges for your telecommunications services.

Avaya Fraud Intervention

If you suspect that you are being victimized by toll fraud and you need technical assistance or support, in the United States and Canada, call the Technical Service Center's Toll Fraud Intervention Hotline at 1-800-643-2353.

How to Get Help

For additional support telephone numbers, go to the Avaya support Web site: http://www.avaya.com/support. If you are:

- Within the United States, click the *Escalation Management* link. Then click the appropriate link for the type of support you need.
- Outside the United States, click the *Escalation Management* link. Then click the *International Services* link that includes telephone numbers for the international Centers of Excellence.

Providing Telecommunications Security

Telecommunications security (of voice, data, and/or video communications) is the prevention of any type of intrusion to (that is, either unauthorized or malicious access to or use of) your company's telecommunications equipment by some party.

Your company's "telecommunications equipment" includes both this Avaya product and any other voice/data/video equipment that could be accessed via this Avaya product (that is, "networked equipment").

An "outside party" is anyone who is not a corporate employee, agent, subcontractor, or is not working on your company's behalf. Whereas, a "malicious party" is anyone (including someone who may be otherwise authorized) who accesses your telecommunications equipment with either malicious or mischievous intent.

Such intrusions may be either to/through synchronous (time-multiplexed and/or circuit-based) or asynchronous (character-, message-, or packet-based) equipment or interfaces for reasons of:

- Utilization (of capabilities special to the accessed equipment)
- Theft (such as, of intellectual property, financial assets, or toll facility access)
- Eavesdropping (privacy invasions to humans)
- Mischief (troubling, but apparently innocuous, tampering)
- Harm (such as harmful tampering, data loss or alteration, regardless of motive or intent)

Be aware that there may be a risk of unauthorized intrusions associated with your system and/or its networked equipment. Also realize that, if such an intrusion should occur, it could result in a variety of losses to your company (including but not limited to, human/data privacy, intellectual property, material assets, financial resources, labor costs, and/or legal costs).

Responsibility for Your Company's Telecommunications Security

The final responsibility for securing both this system and its networked equipment rests with you - Avaya's customer system administrator, your telecommunications peers, and your managers. Base the fulfillment of your responsibility on acquired knowledge and resources from a variety of sources including but not limited to:

- Installation documents
- System administration documents
- Security documents
- Hardware-/software-based security tools
- Shared information between you and your peers
- Telecommunications security experts

To prevent intrusions to your telecommunications equipment, you and your peers should carefully program and configure:

- Your Avaya-provided telecommunications systems and their interfaces
- Your Avaya-provided software applications, as well as their underlying hardware/software platforms and interfaces
- Any other equipment networked to your Avaya products

TCP/IP Facilities

Customers may experience differences in product performance, reliability and security depending upon network configurations/design and topologies, even when the product performs as warranted.

Standards Compliance

Avaya Inc. is not responsible for any radio or television interference caused by unauthorized modifications of this equipment or the substitution or attachment of connecting cables and equipment other than those specified by Avaya Inc. The correction of interference caused by such unauthorized modifications, substitution or attachment will be the responsibility of the user. Pursuant to Part 15 of the Federal Communications Commission (FCC) Rules, the user is cautioned that changes or modifications not expressly approved by Avaya Inc. could void the user's authority to operate this equipment.

Product Safety Standards

This product complies with and conforms to the following international Product Safety standards as applicable:

Safety of Information Technology Equipment, IEC 60950, 3rd Edition including all relevant national deviations as listed in Compliance with IEC for Electrical Equipment (IECEE) CB-96A.

Safety of Information Technology Equipment, CAN/CSA-C22.2 No. 60950-00 / UL 60950, 3rd Edition

Safety Requirements for Customer Equipment, ACA Technical Standard (TS) 001 - 1997

One or more of the following Mexican national standards, as applicable: NOM 001 SCFI 1993, NOM SCFI 016 1993, NOM 019 SCFI 1998

The equipment described in this document may contain Class 1 LASER Device(s). These devices comply with the following standards:

- EN 60825-1, Edition 1.1, 1998-01
- 21 CFR 1040.10 and CFR 1040.11.

The LASER devices operate within the following parameters:

- Maximum power output: -5 dBm to -8 dBm
- Center Wavelength: 1310 nm to 1360 nm

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Klass 1 Laser Apparat

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposures. Contact your Avaya representative for more laser product information.

Electromagnetic Compatibility (EMC) Standards

This product complies with and conforms to the following international EMC standards and all relevant national deviations:

Limits and Methods of Measurement of Radio Interference of Information Technology Equipment, CISPR 22:1997 and EN55022:1998.

Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement, CISPR 24:1997 and EN55024:1998, including:

- Electrostatic Discharge (ESD) IEC 61000-4-2
- Radiated Immunity IEC 61000-4-3
- Electrical Fast Transient IEC 61000-4-4
- Lightning Effects IEC 61000-4-5
- Conducted Immunity IEC 61000-4-6
- Mains Frequency Magnetic Field IEC 61000-4-8
- Voltage Dips and Variations IEC 61000-4-11
- Powerline Harmonics IEC 61000-3-2
- Voltage Fluctuations and Flicker IEC 61000-3-3

Federal Communications Commission Statement

Part 15:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Part 68: Answer-Supervision Signaling

Allowing this equipment to be operated in a manner that does not provide proper answer-supervision signaling is in violation of Part 68 rules. This equipment returns answer-supervision signals to the public switched network when:

- answered by the called station,
- answered by the attendant, or
- routed to a recorded announcement that can be administered by the customer premises equipment (CPE) user.

This equipment returns answer-supervision signals on all direct inward dialed (DID) calls forwarded back to the public switched telephone network. Permissible exceptions are:

- A call is unanswered.
- A busy tone is received.
- A reorder tone is received.

Avaya attests that this registered equipment is capable of providing users access to interstate providers of operator services through the use of access codes. Modification of this equipment by call aggregators to block access dialing codes is a violation of the Telephone Operator Consumers Act of 1990.

REN Number

For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

This equipment complies with Part 68 of the FCC rules. On either the rear or inside the front cover of this equipment is a label that contains, among other information, the FCC registration number, and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.

For G350 and G700 Media Gateways:

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the rear of this equipment is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. The digits represented by ## are the ringer equivalence number (REN) without a decimal point (for example, 03 is a REN of 0.3). If requested, this number must be provided to the telephone company.

For all media gateways:

The REN is used to determine the quantity of devices that may be connected to the telephone line. Excessive RENs on the telephone line may result in devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed 5.0. To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company.

REN is not required for some types of analog or digital facilities.

Means of Connection

Connection of this equipment to the telephone network is shown in the following tables.

For MCC1, SCC1, CMC1, G600, and G650 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/ A.S. Code	Network Jacks
Off premises station	OL13C	9.0F	RJ2GX, RJ21X, RJ11C
DID trunk	02RV2-T	0.0B	RJ2GX, RJ21X
CO trunk	02GS2	0.3A	RJ21X
	02LS2	0.3A	RJ21X
Tie trunk	TL31M	9.0F	RJ2GX
Basic Rate Interface	02IS5	6.0F, 6.0Y	RJ49C
1.544 digital interface	04DU9-BN	6.0F	RJ48C, RJ48M
	04DU9-IKN	6.0F	RJ48C, RJ48M
	04DU9-ISN	6.0F	RJ48C, RJ48M
120A4 channel service unit	04DU9-DN	6.0Y	RJ48C

For G350 and G700 Media Gateways:

Manufacturer's Port Identifier	FIC Code	SOC/REN/ A.S. Code	Network Jacks
Ground Start CO trunk	02GS2	1.0A	RJ11C
DID trunk	02RV2-T	AS.0	RJ11C
Loop Start CO trunk	02LS2	0.5A	RJ11C
1.544 digital interface	04DU9-BN	6.0Y	RJ48C
	04DU9-DN	6.0Y	RJ48C
	04DU9-IKN	6.0Y	RJ48C
	04DU9-ISN	6.0Y	RJ48C
Basic Rate Interface	02IS5	6.0F	RJ49C

For all media gateways:

If the terminal equipment (for example, the media server or media gateway) causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact the Technical Service Center at 1-800-242- 2121 or contact your local Avaya representative. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

A plug and jack used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA. A compliant telephone cord and modular plug is provided with this product. It is designed to be connected to a compatible modular jack that is also compliant. It is recommended that repairs be performed by Avaya certified technicians.

The equipment cannot be used on public coin phone service provided by the telephone company. Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

This equipment, if it uses a telephone receiver, is hearing aid compatible.

Canadian Department of Communications (DOC) Interference Information

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

Declarations of Conformity

United States FCC Part 68 Supplier's Declaration of Conformity (SDoC)

Avaya Inc. in the United States of America hereby certifies that the equipment described in this document and bearing a TIA TSB-168 label identification number complies with the FCC's Rules and Regulations 47 CFR Part 68, and the Administrative Council on Terminal Attachments (ACTA) adopted technical criteria.

Avaya further asserts that Avaya handset-equipped terminal equipment described in this document complies with Paragraph 68.316 of the FCC Rules and Regulations defining Hearing Aid Compatibility and is deemed compatible with hearing aids.

Copies of SDoCs signed by the Responsible Party in the U. S. can be obtained by contacting your local sales representative and are available on the following Web site: http://www.avaya.com/support.

All Avaya media servers and media gateways are compliant with FCC Part 68, but many have been registered with the FCC before the SDoC process was available. A list of all Avaya registered products may be found at: http://www.part68.org by conducting a search using "Avaya" as manufacturer.

European Union Declarations of Conformity

CE

Avaya Inc. declares that the equipment specified in this document bearing the "CE" (*Conformité Europeénne*) mark conforms to the European Union Radio and Telecommunications Terminal Equipment Directive (1999/5/EC), including the Electromagnetic Compatibility Directive (89/336/EEC) and Low Voltage Directive (73/23/EEC). This equipment has been certified to meet CTR3 Basic Rate Interface (BRI) and CTR4 Primary Rate Interface (PRI) and subsets thereof in CTR12 and CTR13, as applicable.

Copies of these Declarations of Conformity (DoCs) can be obtained by contacting your local sales representative and are available on the following Web site: http://www.avaya.com/support.

Japan

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may occur, in which case, the user may be required to take corrective actions.

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Attention: Avaya Account Management

E-mail: totalware@gwsmail.com

For the most current versions of documentation, go to the Avaya support Web site: http://www.avaya.com/support.

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1 About this book

Overview

This document provides procedures to monitor, test, and maintain an Avaya Media Server or Gateway system. It covers many of the faults and troubles that can occur and provides simple procedures to correct them. Simple, traditional troubleshooting methods are sometimes sufficient to locate and clear faults. The traditional methods include substitution, visual inspections, continuity checks, and clarification of operating procedures with end users.

Using this documentation, the Avaya technicians and the technicians of their business partners and customers should be able to follow detailed procedures for:

- Monitoring, testing, and maintaining an Avaya Media Server, Media Gateway, and many other system components.
- Using troubleshooting methods to clear faults.
- Required replacements, visual inspections, continuity checks, and clarifying operating procedures with end users.

Structure of book

The following document contains combined Maintenance Alarms information for:

- S8100, S8300, S8500, and S8700 media servers
- MCC1, SCC1, and CMC1 media gateways
- G600, G650, and G700 media gateways

The document includes new information developed for Communication Manager Release 2.0, and preexisting or modified information brought together from Release 1.3 maintenance documentation.

This document is the first of three reference documents:

- Maintenance Alarms Reference (555-245-102)
- Maintenance Commands Reference (555-245-101)
- Maintenance Procedures (555-245-103)

The basis for these reference documents was the Release 1.3 S8700 media server with the MCC1 and SCC1 media gateways maintenance document. To this document were added Release 1.3 maintenance information for the S8300 and S8100 media servers, the G700, G600 and CMC1 media gateways, as well as new material developed for the S8500 media server and G650 media gateway.

In order to present maintenance information from all these sources side-by-side, when it was not clear from a chapter or section title, marking conventions were adopted to delineate material specific to a particular source. The markers act on three levels:

- Chapters or Maintenance Objects (MOs)
- Major and minor sections
- Paragraphs or in-line comments

Chapters or Maintenance Objects (MOs)

At the Chapter or MO level, bold names of the server(s) or gateway(s) that are represented within the sections to follow are inserted immediately after the Chapter title or MO title. For example, the heading for the SER-BUS (Serial communication bus) MO looks like:

SER-BUS (Serial communication bus)

G650

The **G650** after the title indicates that the material in this MO relates to the G650 media gateway.

Major and minor sections

At the Major and minor sections level, a similar bold name along with a ruled line delineates the beginning of a section of material specific to the media server or gateway identified. At the conclusion of the section, another ruled line marks the end of the specific material and a return to common text. For example, a section of material specific to the S8100 media server looks like:

S8100 only

For the Processor Port Network (PPN)

1. Terminate the TDM Bus so that it extends within the control carrier.
2. Run the **test tdm** system technician command. If any of the TDM Bus tests fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in those carriers connected to the *shortened* TDM Bus. Procedure 2 is performed for port circuit packs (purple slots) and Procedure 3 for control carrier circuit packs.
3. If none of the TDM Bus tests fail, extend the TDM Bus to another carrier and repeat this procedure. When a carrier is added that causes some of the TDM Bus tests to fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in that carrier.

Such sections can occasionally extend for several pages.

Paragraphs or in-line comments

At the paragraph level and for comments in-line, the specific media server or gateway is indicated by its bold name, and the parenthetical information follows immediately afterward. For example, a paragraph insert for the S8700 and S8500 media servers might looks like:

1. If the Tone-Clock circuit is a slave clock, then the EI to which it is listening is providing a bad timing source. Follow the diagnostic procedures specified for TDM-CLK Error Code 2305.
2. **S8700** / **S8500**: If no problem can be found with the incoming synchronization signal, replace the IPSI or Tone-Clock circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

In such cases, it is not necessary to delineate the beginning and end of the material.

An example of an in-line comment might look like:

Error Type 1282 — Indicates that the TN2182 tone-clock (**S8100**: TN2314 Processor/Tone Clock) was synchronized to a DS1 facility and that the reference frequency provided by the DS1 drifted beyond a range that could be tracked by the TN2182 (**S8100**: TN2314).

It is hoped that, by these techniques, material specific to several different sources can be combined and viewed side-by-side without confusion.

Audience

The information in this book is intended for use by:

Avaya technicians, provisioning specialists, business partners, and customers, specifically:

- Trained Avaya technicians
- A maintenance technician dispatched to a customer site in response to a trouble alarm or a user trouble report
- A maintenance technician located at a remote maintenance facility
- The customer's assigned maintenance technician

  The technician is expected to have a knowledge of telecommunications fundamentals and of the particular Avaya Media Server and/or Media Gateway to the extent that the procedures in this book can be performed, in most cases, without assistance.

This book is not intended to solve all levels of troubles. It is limited to troubles that can be solved using:

- The Alarm Log
- The Error Log
- Trouble-clearing procedures
- Maintenance tests
- Traditional troubleshooting methods

If the trouble still has not been resolved, it is the maintenance technician's responsibility to escalate the problem to a higher level of technical support. Escalation should conform to the procedures in the Technical and Administration Escalation Plan.

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   - **PDF Format** to download the book in regular PDF format
   - **ZIP Format** to download the book in zipped PDF format

Safety labels and security alert labels

Observe all caution, warning, and danger statements to help prevent loss of service, equipment damage, personal injury, and security problems. This book uses the following safety labels and security alert labels:

CAUTION:
A caution statement calls attention to a situation that can result in harm to software, loss of data, or an interruption in service.

WARNING:
A warning statement calls attention to a situation that can result in harm to hardware or equipment.

DANGER:
A danger statement calls attention to a situation that can result in harm to personnel.

SECURITY ALERT:
A security alert calls attention to a situation that can increase the potential for unauthorized use of a telecommunications system.

Safety precautions

When performing maintenance or translation procedures on the system, users must observe certain precautions. Observe all caution, warning, and danger admonishments to prevent loss of service, possible equipment damage, and possible personal injury. In addition, the following precautions regarding electromagnetic interference (EMI) and static electricity must be observed:

Electromagnetic interference

This equipment generates, uses, and can radiate radio frequency energy. Electromagnetic fields radiating from the switch may cause noise in the customer's equipment. If the equipment is not installed and used in accordance with the instruction book, radio interference may result.

WARNING:
To maintain the EMI integrity of the system, maintenance personnel must ensure that all cabinet panels, covers, and so forth, are firmly secured before leaving the customer's premises.

Related resources

Table 1, Additional document resources, on page 20 lists additional documentation that is available for you, and which has been referenced within this document.

Table 1: Additional document resources

Document	Number
Administrator's Guide for Avaya™ Communication Manager, 555-233-506	555-233-506
Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100	555-234-100
Maintenance Alarms Reference (555-245-102)	555-245-102
Maintenance Commands Reference (555-245-101)	555-245-101
Maintenance Procedures (555-245-103)	555-245-103
Maintenance for Avaya DEFINITY® Server R, 555-233-117	555-233-117
Avaya™ P333T User's Guide	N/A
Avaya™ S8300 and Avaya™ S8700 Media Server Library, 555-233-825	555-233-825
EMBEDDED AUDIX System Maintenance, 585-300-110	585-300-110
DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110	585-300-110
AT&T Network and Data Connectivity , 555-025-201	555-025-201
Digital PBX Standards, RS4648	RS4648
User Manual Z3A Asynchronous Data Unit, 555-401-701	555-401-701
Avaya™ Communication Manager, Avaya DEFINITY® Servers and Avaya™ S8100 Media Server Library, 555-233-823	555-233-823
DEFINITY® Communications System Generic 1, Generic 2 and Generic 3 V1 and 2 – Integrated Channel Service Unit (CSU) Module Installation and Operation, 555-230-193	555-230-193
DEFINITY® Communications System Generic 2.2 and Generic 3 V2 DS1/CEPT1/ISDN-PRI Reference, 555-025-107	555-025-107
DEFINITY® Communications System Generic 1 and Generic 3i Wiring, 555-204-111	555-204-111
Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146	555-233-146
Site Preparation, Installation, and Operator's Manual, 167-405-035	167-405-035
Maintenance for the Avaya™ S8700 Media Server with an Avaya™ SCC1 Media Gateway or an Avaya™ MCC1 Media Gateway, 555-233-143	555-233-143
	1 of 2

Table 1: Additional document resources

Document	Number
Avaya MultiVantage™ Solutions Installation and Maintenance for Survivable Remote EPN, 555-233-121	555-233-121
Installing the Avaya™ S8700 Media Server with the Avaya™ G600 Media Gateway, the Avaya™ MCC1 Media Gateway, or the Avaya™ SCC1 Media Gateway (Library CD)	Library CD
ATM Installation, Upgrades, and Administration using Avaya™ Communication Manager, 555-233-124	555-233-124
	2 of 2

Technical assistance

Avaya provides the following resources for technical assistance.

Within the United States

For help with:

- Feature administration and system applications, call the Avaya DEFINITY Helpline at 1-800-225-7585
- Maintenance and repair, call the Avaya National Customer Care Support Line at 1-800-242-2121
- Toll fraud, call Avaya Toll Fraud Intervention at 1-800-643-2353

International

For all international resources, contact your local Avaya authorized dealer for additional help.

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- Fax, send your comments to:

  1-303-538-1741

Ensure that you mention the name and number of this book.

How to use this Document

Most maintenance sessions involve analyzing the Alarm and Error Logs to diagnose a trouble source and replacing a component such as a circuit pack or media module. The information in Chapter 5, "Communication Manager Maintenance-Object Repair Procedures" of this reference will generally suffice to address these needs. Certain complex elements of the system require a more comprehensive approach. Special procedures for these elements appear in Chapter 6, "Troubleshooting" of *Maintenance Procedures (555-245-103)*.

NOTE:
This document is designed to be read online and in paper format. Because of the large volume of information, additional cross-references have been added to make it easier to locate information when using the manual online.

Organization

Chapter 2, "LEDs", contains information on the definition and interpretation of LED indicators to be found on various system components, including servers, gateways, circuit packs, and media modules.

Chapter 3, "Server Alarms", contains information on alarms generated on various platforms, including the S8300, S8500, and S8700 media server. These alarms cover such categories as process watchdog , environmental, login, translation monitoring, and power supply alarms. Alarm identifications, levels, and resolutions are given.

Chapter 4, "G700 Media Gateway Traps", contains information on traps that can occur on media gateways. Trap identifications, alarm levels, trap descriptions, and recommended resolutions are given.

Chapter 5, "Communication Manager Maintenance-Object Repair Procedures", contains specific troubleshooting and repair instructions for every component in the system. The maintenance objects are listed alphabetically by name as they appear in the Alarm and Error Logs. Under each maintenance object appears a description of the object's function, tables for interpreting alarm and error logs, and instructions on how to use tests, commands, and replacements to resolve associated problems.

Conventions used in this document

Table 2, Typography used in this book, on page 23 lists the typographic conventions in this document.

Table 2: Typography used in this book

To represent . . .	This typeface and syntax are shown as . . .	For example, . . .
SAT commands	• Bold for **literals** • Bold italic for ***variables*** • Square brackets **[ ]** around optional parameters • "|" between exclusive choices	**refresh ip-route [all** | *location***]**
SAT screen input and output	• Bold for **input** • Constant width for `output (screen displays and messages)`	Set the `Save Translation` field to **daily**. The message `Command successfully completed` should appear.
Linux commands	• Constant-width bold for **`literals`** • Constant-width bold italics for ***`variables`*** • Square brackets **`[]`** around optional arguments • "Or" sign **`|`** between exclusive choices	**`testmodem [-s] | [-t arg]`**
Linux output	`Constant width`	Linux returns the message `almdisplay 4: Unable to connect to MultiVantage`.

1 of 2

Table 2: Typography used in this book

To represent . . .	This typeface and syntax are shown as . . .	For example, . . .
Web interface	• Bold for **menu selections, tabs, buttons,** and **field names** • Right arrow > to separate a sequence of menu selections	Select **Alarms and Notification,** the appropriate alarm, and then click **Clear**. Select **Diagnostics** > **View System Logs**, then click **Watchdog Logs**.
Keys	Special font for keyboard keys and SAT screen clickable buttons	Press Tab. Click Next Page.
		2 of 2

Other conventions used in this book:

- Physical dimensions are in English [Foot Pound Second (FPS)] units, followed by metric [Centimeter Gram Second) (CGS)] units in parentheses.

  Wire-gauge measurements are in AWG, followed by the diameter in millimeters in parentheses.
- Circuit-pack codes (such as TN790 or TN2182B) are shown with the minimum acceptable alphabetic suffix (like the “B” in the code TN2182B).

  Generally, an alphabetic suffix higher than that shown is also acceptable. However, not every vintage of either the minimum suffix or a higher suffix code is necessarily acceptable.

Useful terms

Table 3, Terminology summary, on page 24 summarizes some of the terms used in this book and relates them to former terminology.

Table 3: Terminology summary

Present Terminology	Former Terminology
Communication Manager	MultiVantage Avaya Call Processing
S8300 Media Server	ICC, Internal Call Controller
S8700 Media Server (or non-co-resident S8300)	ECC, External Call Controller
MGP, Media Gateway Processor	860T Processor
Layer 2 Switching Processor	P330 Stack Processor Cajun Stack Processor i960 Processor

2 LEDs

This chapter describes the meanings of the LEDs on system components and the alarm levels they indicate. The chapter includes the following topics:

- Alarm levels on page 25
- Terminal alarm notification on page 26
- Attendant console LEDs on page 26
- Circuit pack LEDs on page 27
- Expansion Interface circuit pack LEDs on page 28
- Maintenance circuit pack LEDs on page 29
- DS1C (TN574/TN1654) circuit pack LEDs on page 30
- Switch Node Interface LEDs on page 34
- Tone-Clock circuit pack LEDs on page 34
- S8700 Media Server LEDs on page 41
- IPSI LEDs on page 37
- Duplication memory card LEDs on page 41

Alarm levels

If a maintenance object in the system begins to fail some of the periodic tests, the system automatically generates an alarm that indicates the system needs to be restored to a normal condition. The system identifies three levels of alarms:

- **Major alarms** — Failures that cause critical degradation of service and require immediate attention.
- **Minor alarms** — Failures that cause some degradation of service, but do not render a crucial portion of the system inoperable. This condition requires action, but its consequences are not immediate. Problems might be impairing service to a few trunks or stations or interfering with one feature across the entire system.
- **Warning alarms** — Failures that cause no significant degradation of service or failures in equipment external to the system.

Alarms are communicated to the system users and technicians by entries in the alarm log and the lighting of LEDs located on the attendant console, on all circuit packs, on the server, on the Cajun Ethernet switch if there is one, and, optionally, on customer-designated voice terminals. Warning alarms are not reported to the attendant console.

Terminal alarm notification

Terminal alarm notification is an optional feature which displays several types of alarms on voice terminals with administered feature buttons or the attendant console. A maximum of 10 digital and/or hybrid voice terminals may be used.

When an alarm occurs, the green status LED associated with the assigned button will be in a steady state. The LED may be turned off by pressing the button associated with the lighted alarm LED. If the LED is turned off and the alarm has not been resolved by the time maintenance reschedules testing, the green status LED will resume its steady state.

The following alarms are displayed:

ac-alarm	Administered Connection alarm: A locally administered connection (ADM-CONN) has a major, minor, or warning alarm active.
pr-awu-alm	Auto Wakeup Journal Printer alarm: The automatic wakeup journal printer has a major, minor, or warning alarm active.
off-bd-alarm	DS1 or ATM Facility alarm: An off-board major, minor, or warning alarm is active on a DS1-BD, UDS1-BD, or ATM-TRK board.
trk-ac-alm	Facility Access alarm: The facility access trunk test feature is activated.
major-alrm	Major alarm: The system has logged a major alarm.
mj/mn-alrm	Major/Minor alarm: The system has logged a major or minor alarm.
pr-pms-alm	The Property Management System (PMS) printer has a major, minor, or warning alarm active.
rs-alert	Reset-Alert: **reset system 2** or **3** has been performed.
cdr1-alrm	Call Detail Recording alarm: The primary CDR link has a major, minor, or warning alarm active.
cdr2-alrm	Call Detail Recording alarm: The secondary link has a major, minor, or warning alarm active.
pr-sys-alm	System Printer alarm: The System Printer (SYS-PRNT) has a major, minor, or warning alarm active.
pms-alarm	The Property Management System has a major, minor or warning alarm active.

Attendant console LEDs

The console has two red LEDs, labeled “ALM” and “ACK.” The ALM LED lights steadily when there is a major or minor alarm at the switch cabinet. The ACK LED lights steadily if the alarm has been successfully reported. If the system is unable to report the alarm, the LED flashes; this signals the attendant to call the Avaya alarm receiving system and report the alarm.

Circuit pack LEDs

Typically each circuit pack has three LEDs on the front panel visible at the front of the carrier. There are some exceptions to this (for example, DS1CONV or IPSI circuit pack) that are covered later in this section. On most circuit packs, the LEDs indicate the following when lit (Table 4, LED indicators, on page 27). Exceptions to these indications are explained in subsequent sections.

Table 4: LED indicators

LED Color	State	Interpretation
Red	Alarm	The system has detected a fault in this circuit pack. The alarm log should contain an on-board alarm for this circuit pack or one of the maintenance objects associated with it. The red LED is also lit briefly when a circuit pack is inserted or reset. If the circuit pack passes its initialization tests, the LED is extinguished. If a fault is detected, it remains lit.
Green	Testing	The system is currently running tests on this circuit pack as part of background maintenance or demand testing. This LED is also lit briefly during initialization tests when a circuit pack is inserted or reset.
Yellow	Busy	The circuit pack is currently in use by the system.

This section includes LED interpretation on the following circuit packs:

- LED alarms without Alarm Log entry or with Error Type 1 on page 27
- Expansion Interface circuit pack LEDs on page 28
- Maintenance circuit pack LEDs on page 29
- DS1C (TN574/TN1654) circuit pack LEDs on page 30
- Switch Node Interface LEDs on page 34
- Tone-Clock circuit pack LEDs on page 34
- IPSI LEDs on page 37

LED alarms without Alarm Log entry or with Error Type 1

Whenever the system or a part of the system is reset, every affected circuit pack will briefly light their red and green LEDs as they are initialized. Upon power up of a newly installed system, several alarm indicators may remain lit until the circuit packs are administered. These alarms should be ignored until administration is completed.

Boards with a “P” suffix have downloadable firmware. If such a board has both its green and yellow LEDs lit simultaneously, a download may be in progress and the board will not appear to be recognized. Use either the SAT command **status firmware download** or **status firmware download last** to verify this condition.

After a circuit pack has been initialized, a red LED should be accompanied by an alarm in the alarm log. A single fault can sometimes light alarm LEDs on several circuit packs, as in the following examples.

- A TDM bus problem may cause several port circuit packs to display red LEDs.
- A Maintenance circuit pack can prevent an Expansion Interface (EI) circuit pack from initializing.
- Extensive interactions in the Center Stage Switch (CSS) can cause multiple alarms from single faults in DS1C, SNI and SNC circuit packs and fiber links.
- Tone-Clock problems may cause other circuit packs to report alarms.
- Misconnected optical fiber cables may cause several circuit packs to alarm.
- Packet-bus faults can cause several port circuit packs to display red LEDs.

If a circuit pack has had at least five minutes to be initialized, and the red LED is lit without an associated alarm in the alarm log, the circuit pack may not be in communication with the system. This may also be the case when a circuit pack is properly administered and present in its slot, but there is an error type 1 logged against it. To determine whether this is so, proceed as follows:

1. Issue the **list configuration board *UUCSS*** command. If the system does not detect the circuit pack, this command will return:

   `identifier not assigned` or `no board`.

   If the documentation for the associated maintenance object gives no special instructions for this situation, go to the next step.

2. Check the hardware error log for TONE-BD or TDM-BUS errors. If the board has a “P” suffix execute the **reset board *UUCSS*** command, otherwise execute the **test tdm** and **test tone-clock** commands and use the appropriate maintenance procedures to resolve any identified faults. If this does not resolve the problem, go to the next step.

3. Reseat the suspect circuit pack.

   CAUTION:
   This procedure can cause a partial or total service outage. Consult thoroughly the documentation for the associated maintenance object before proceeding. Observe the precautions and procedures described above.

4. Inspect the backplane connectors for bent pins.

5. If the system seems to be functioning correctly, but the circuit pack in question will not communicate with the system, replace the circuit pack.

Expansion Interface circuit pack LEDs

The Expansion Interface (EI) TN570 circuit pack has the standard red, green and yellow LEDs. The red and green LEDs have the traditional meaning, where red indicates an alarm condition, and green indicates testing in progress.

The yellow LED displays various flashing patterns to provide status information useful in isolating faults in the fiber link and other components connected to the fiber link. Table 5, Expansion Interface yellow LED flashing codes, on page 29 illustrates the EI yellow LED states.

Table 5: Expansion Interface yellow LED flashing codes

LED on	LED off	Condition
0.1 sec	0.1 sec	Fiber Out-of-Frame. This state indicates a failure of test #989. This may be caused by absence of the opposite end EI or Switch Node Interface (SNI), a broken or missing fiber, or a missing lightwave transceiver on either endpoint.
0.5 sec	0.5 sec	In Frame — No Neighbor. This state corresponds to a failure of test # 237, usually due to a failure of this EI or of the EI or SNI at the other end of the fiber.
2 sec	0.2 sec	EI Active. This is the normal state of an active EI that is an archangel of an EPN.
solid on		EI Active. This is the normal state for an active EI that is not an EPN archangel. These include EPN EIs connected to other EPN EIs in direct connect configurations, and EIs located in the processor port network.
	solid off	EI Standby. This is the normal state for a standby EI in systems with a duplication option.

Maintenance circuit pack LEDs

TN775D PN maintenance circuit packs have seven LEDs on their front panels. The top three LEDs are the standard group of red, green and yellow, and indicate the status of the circuit pack. The green LED on TN775Ds blinks faintly once per second, indicating continual self-testing.

The second group of three LEDs, labeled “ALARMS”, reflects maintenance conditions throughout the system and indicates alarms reported against other components, as shown in Table 6, Maintenance circuit pack LED interpretation, on page 29.

Table 6: Maintenance circuit pack LED interpretation

LED color	State	Level/ Function	Interpretation
Red	flashing	MAJOR	Major alarm against a component in the same cabinet.
	solid	MAJOR	Major alarm against a component in another cabinet.
	solid	MINOR	Minor alarm against a component in another cabinet.
	flashing	MINOR	Minor alarm against a component in the same cabinet.

Table 6: Maintenance circuit pack LED interpretation

Yellow	flashing	WARNING	Warning alarm against a component in the same cabinet.
	solid	WARNING	Warning alarm against a component in another cabinet.
Green	on	ACK	Acknowledged; alarm has been reported.
Red	on	EMERGENCY TRANSFER	Emergency transfer has been invoked. This occurs upon power-up as well as during disabling failures.

These LEDS are illustrated Figure 1, TN775 circuit pack LEDs on faceplate, on page 30.

Figure 1: TN775 circuit pack LEDs on faceplate

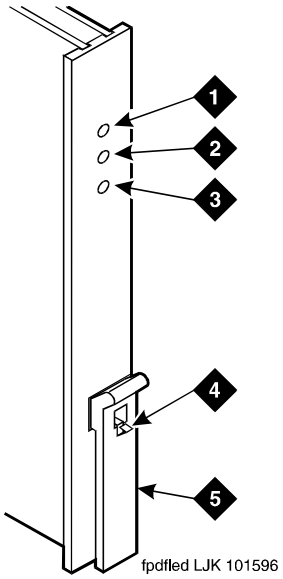


Figure notes

1	Alarm LED (Red)	**4**	Latch pin
2	Test LED (Green)	**5**	Locking lever
3	Busy LED (Yellow)		

DS1C (TN574/TN1654) circuit pack LEDs

The TN574 and the TN1654 LEDs provide an indication of the state of the DS1 converter and facilities.

NOTE:
DS1 converters are used exclusively with a CSS.

TN574 circuit pack LEDs

Seven LEDs provide an indication of the state of the DS1 converter (DS1C-BD) TN574 circuit pack and the DS1 facilities. The top group has the standard red, green and yellow LEDs. The red and green LEDs have the traditional meaning, where red indicates an alarm condition, and green indicates testing in progress. The four green LEDs on the bottom indicate the status of the DS1 facilities (see following section).

The yellow LED is used to indicate the state of the fiber interface, the fiber channel, and the DS1 channel as listed in Table 7, DS1C yellow LED flashing states, on page 31 in order of priority.

Table 7: DS1C yellow LED flashing states

LED on	LED off	Condition
0.1 sec	0.1 sec	Fiber Out-of-Frame or Fiber Loss of Signal
0.5 sec	0.5 sec	In Frame, fiber channel down. The fiber channel communicating between the DS1C and the other fiber endpoint (EI or SNI) is down.
1 sec	1 sec	In Frame, DS1 channel down. The channel between the two DS1Cs in the DS1C complex is down.
solid on		DS1C active. This is the normal state for an active DS1C.
	solid off	DS1C standby. This is the normal state for a standby DS1C in critical-reliability systems (duplicated PNC).

DS1 Facility LEDs

Below the three standard LEDs on the DS1C circuit pack are four green LEDs that indicate whether a receive signal is present for each of the four DS1 facilities. Figure 2, TN574 DS1 Converter circuit pack LEDs, on page 32 shows which facility (A, B, C, or D) corresponds to each LED. If a green LED is off, there is a Loss of Signal condition on the DS1 facility associated with that LED. The presence of a signal does not guarantee that the signal is using the correct framing format or line coding; an Alarm Indication Signal indicating that the opposite end of the DS1C complex is out of service may be present.

Figure 2: TN574 DS1 Converter circuit pack LEDs

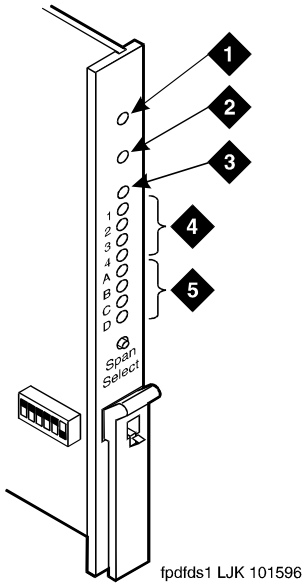


Figure notes

1	Alarm LED (Red)	**4**	STATUS LEDs
2	Test LED (Green)	**5**	SPAN LEDs
3	Busy LED (Yellow)		

TN1654 circuit pack LEDs

The TN1654 DS1C-BD board has 11 LEDs on its faceplate. The top three system standard LEDs indicate the state of the DS1C-BD board. These LEDs are under firmware control until the board has established a link to the S8700 Media Server via the EI or SNI. Once the link is established, software controls the three LEDs. If the link breaks, the LEDs are again under firmware control.

The red and green LEDs have the traditional meaning, where red indicates an alarm condition, and green indicates testing in progress. The red and green LEDs are also turned on during circuit pack initialization by firmware. When the control link to the circuit pack is lost, firmware controls the red LED to indicate an alarm condition.

The yellow LED under firmware control is used to indicate the state of the physical fiber interface, the Fiber Channel (link to EI or SNI), the DS1 Control Channel (link to opposite DS1CONV board), and the S8700 Media Server communications link in the following manner and order of priority. (The yellow LED remains on for longer periods of time as the DS1CONV complex becomes closer to being fully operational.)

1 If the fiber is Out of Frame or if a Fiber Loss of Signal condition exists, the yellow LED will flicker at a 5 Hz rate (on for 100 mS, off for 100 mS).

2 If the fiber channel is down (DS1 Converter circuit pack/fiber endpoint communications), the yellow LED will flash at a 1 Hz rate (on for 500 ms, off for 500 ms).

3 If the DS1 control channel is down between the two DS1CONVs in the DS1CONV complex, the yellow LED will pulse at a 0.5 Hz rate (on for 1 second, off for 1 second).

4 If the S8700 Media Server communications link is down, the yellow LED will wink off every 2 seconds for 200ms (2 sec on, 200 msec off).

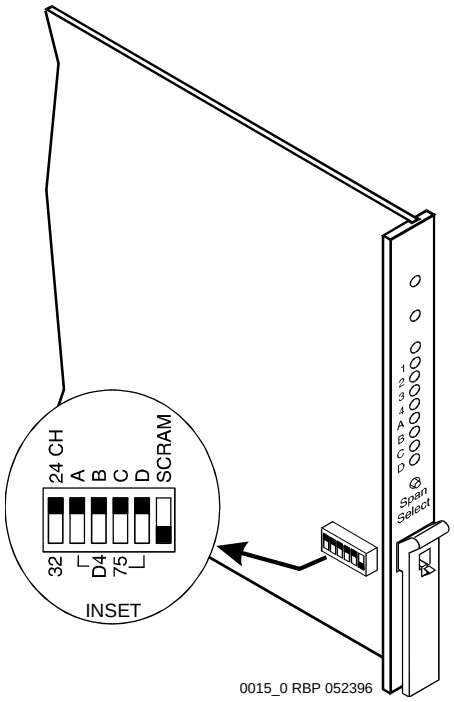
5 If all is well with the fiber interface and every communications channel, the yellow LED will remain on continuously in a standard- or high-reliability system configuration. In critical-reliability systems (duplicated PNC), an active DS1CONV circuit pack will have its yellow LED on continuously, and a standby DS1CONV circuit pack will have its yellow LED off. The LED will then be under software control.

The bottom four green LEDs on the TN574 DS1CONV board are under hardware control. The four green LEDs indicate, for each DS1CONV facility, whether a receive signal is present for the DS1 facility

The next four LEDs on the TN1654 DS1CONV board are labeled STATUS LEDs and are for future use. These LEDs will not be lit.

The bottom four LEDs on the TN1654 board are labeled SPAN LEDs. These LEDs are under firmware control. If the facility is not administered, then the LED is not lit. The LED is lit amber if the facility is running alarm free. If the facility is detecting either a red alarm (loss-of-signal or loss-of-frame), a yellow alarm (remote frame alarm) or a blue alarm (AIS signal) then the LED is lit red. The SPAN SELECT switch on the TN1654 faceplate is for future use. Pushing the switch will have no effect on the board. See Figure 3, TN1654 DS1CONV circuit pack, on page 33 for a view of the faceplate on the TN1654 DS1CONV circuit pack.

Figure 3: TN1654 DS1CONV circuit pack



Switch Node Interface LEDs

The Switch Node Interface (SNI) TN573 circuit pack has the standard red, green, and yellow LEDs. The red and green LEDs have the traditional meaning, where red indicates an alarm condition, and green indicates testing in progress.

The yellow LED displays various flashing patterns to provide status information useful in isolating faults in the fiber link and other components connected to the fiber link. Table 8, Switch Node Interface (SNI) yellow LED flashing states, on page 34 illustrates the SNI yellow LED states.

Table 8: Switch Node Interface (SNI) yellow LED flashing states

LED on	LED off	Condition
0.1 sec	0.1 sec	Fiber Out-of-Frame. This state indicates a failure of test #238, which may be caused by absence of the opposite end EI or Switch Node Interface, a broken or missing fiber, or a missing lightwave transceiver on either endpoint.
0.5 sec	0.5 sec	In Frame — No Neighbor. This state corresponds to a failure of test # 237, usually due to a failure of this SNI, or the EI or SNI at the opposite of the fiber. This condition may also be due to a faulty Switch Node Clock (SNC).
solid on		SNI Active. This is the normal state for an active SNI.
	solid off	SNI Standby. This is the normal state for a standby SNI in systems with a duplication option.

Tone-Clock circuit pack LEDs

The Tone-Clock circuit packs found in non-IPSI-connected port networks have the standard red, green and yellow LEDs. The red LED has the traditional meaning. The yellow and green LEDs flash in specific patterns to indicate the status of the circuit pack. The standby status applies only to systems with a duplication option.

Maintenance/Test circuit pack LEDs

The TN771D maintenance/test circuit pack has the standard red, green, and yellow LEDs. The red and green LEDs have the traditional meaning, where red indicates an alarm condition, and green indicates testing in progress.

The yellow LED can be off or on continuously or flashing, depending on the mode of operation of the TN771D and whether or not it has detected errors. The yellow LED is on steady when the TN771D's analog test port or digital test ports are being used to test trunks or line circuits. The yellow LED is also used to indicate packet-bus status. Table 9, TN771D Maintenance/Test Yellow LED States, on page 35 illustrates the maintenance/test yellow LED states as they apply to packet-bus activity.

Table 9: TN771D Maintenance/Test Yellow LED States

LED State[1]	TN771D Mode	Condition
Solid off	Normal	The Maintenance/Test circuit pack detects no packet-bus faults.
Solid on[2]	Normal	The Maintenance/Test packet-bus port has successfully reconfigured the packet bus around a fault.
Flashing (1 Hz)	Normal	The Maintenance/Test packet-bus port is unable to reconfigure the packet bus around a fault.
Solid off	Standalone[3]	The Maintenance/Test detects no packet-bus faults.
Solid on	Standalone	This condition cannot normally occur. The LED is always either off or blinking in standalone mode.
Flashing (1 Hz)	Standalone	The Maintenance/Test packet-bus port detects a packet-bus fault.

1 It takes 5 to 10 seconds for the yellow LED to respond to a change in the state of the packet bus.

2 Because the yellow LED on the Maintenance/Test circuit pack can also be on steady when the digital and analog test ports on the circuit pack are in use, exact interpretation of the yellow LED may require that the technician busy out the analog and digital test ports or examine the error and alarm logs for PKT-BUS errors and alarms.

3 "Standalone" refers to the TN771D's capability to operate autonomously as a troubleshooting aid.

A detailed description of the TN771D standalone mode is provided in the Standalone mode on page 253 section of Chapter 7, "Packet and serial bus maintenance".

Avaya Ethernet Switch LEDs

The Avaya Ethernet switch's LEDs are shown in Figure 4, Avaya Ethernet switch LEDs, on page 36.

Figure 4: Avaya Ethernet switch LEDs

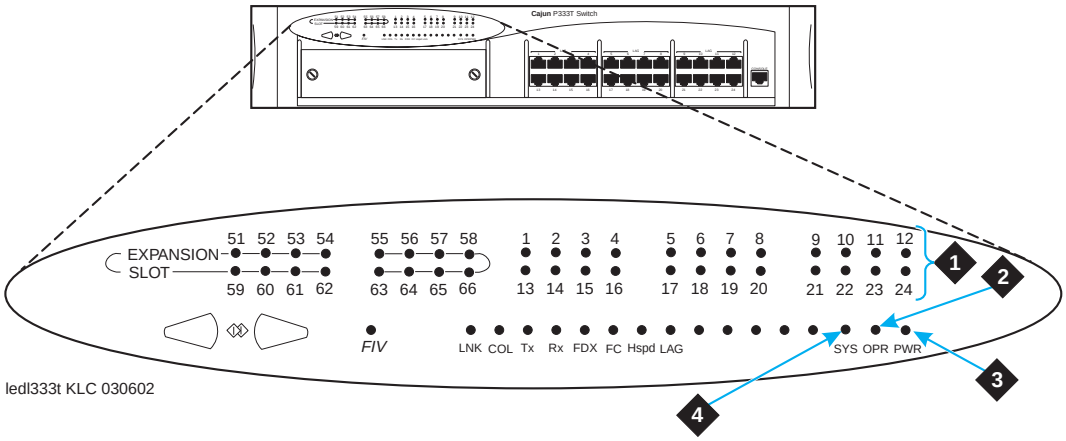


Figure notes

1	Ports in use	**3**	Power
2	CPU boot status	**4**	Lights if this module is the Cajun P33x stack master

The following three LEDs are the primary indicators:

- SYS shows whether this module is the Cajun P330 stack master.
- OPR shows CPU boot status.
- PWR shows when power is on.

For all other LEDs, refer to the quick start guide and user guide that came with the Avaya Ethernet switch.

UPS LEDs

All Ethernet hubs and UPSs have LEDs to indicate that they are powered on or off. LEDs "on" imply the device is powered on. LED "off" implies the device is powered down.

The Powerware front panel has the LEDs shown in Figure 5, UPS LEDs, on page 37.

Figure 5: UPS LEDs

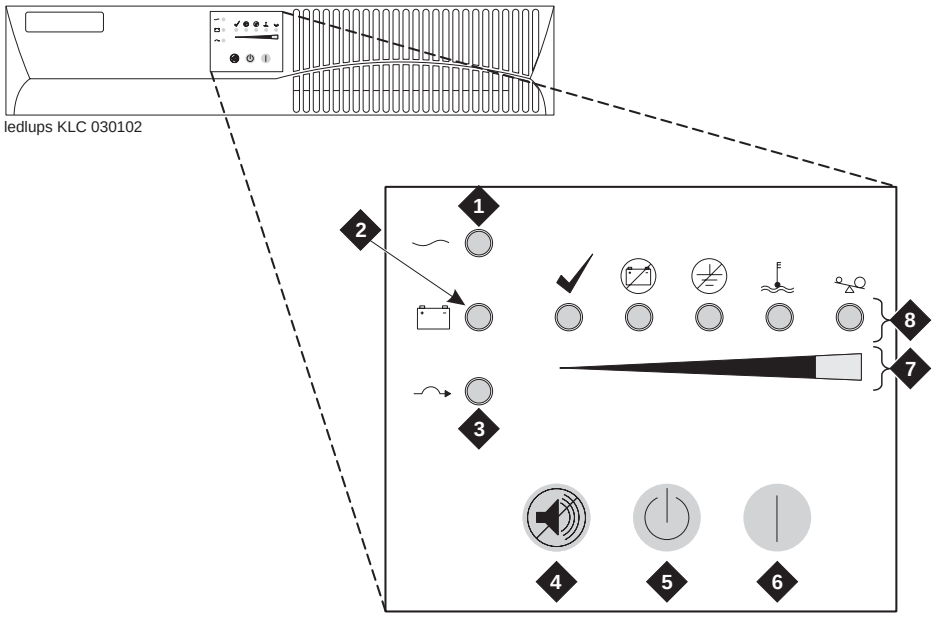


Figure notes

1	Normal mode indicator	**5**	Off button
2	Battery mode indicator	**6**	On button
3	Bypass mode indicator	**7**	Bar graph indicators
4	Test/Alarm reset button	**8**	Alarm indicators

When the Normal mode LED is steady green, it has power. If the LED is flashing, the UPS is in standby mode.

For information on the other LEDs, refer to the UPS user's guide that came with the Powerware UPS unit.

IPSI LEDs

There are four LEDs on the TN2312AP IPSI faceplate, and five LEDs on the TN2312BP IPSI faceplate. The top three LEDs are the standard ones found on most TN circuit packs. The fourth LED imitates the TN2182B Tone-Clock's amber LED. The archangel flashes the yellow LED when active, 2 seconds on and 200 msec off. In addition, the TN2312BP has a fifth LED that shows the emergency transfer control status.

Figure 6: IPSI display showing connectivity status

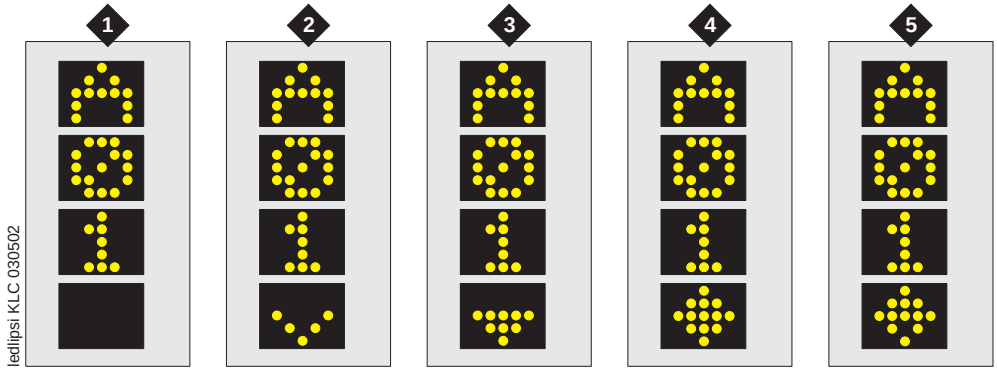


Table 10: IPSI connection status (figure notes)

Connectivity status	1	2	3	4	5
IPSI is connected to Avaya Ethernet switch	no	yes	yes	yes	yes
IPSI has an IP address	no	no	yes	yes	no
Laptop computer is connected to IPSI services port	no	no	no	yes	yes

Figure 7: S8700 IP-Connect IPSI display

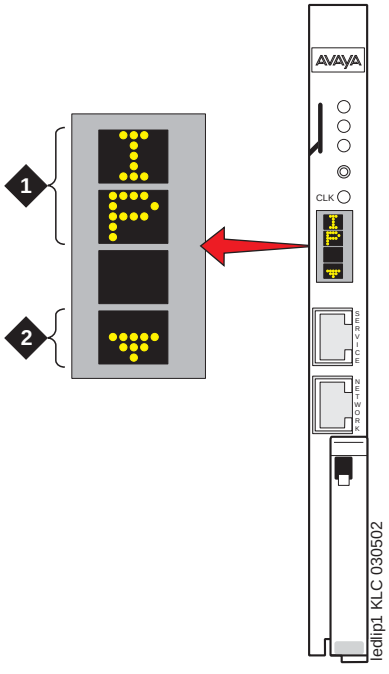


Figure notes

1 IPSI using DHCP

2 IPSI has connectivity and an IP address

Figure 8: S8700 Multi-Connect IPSI Board Display

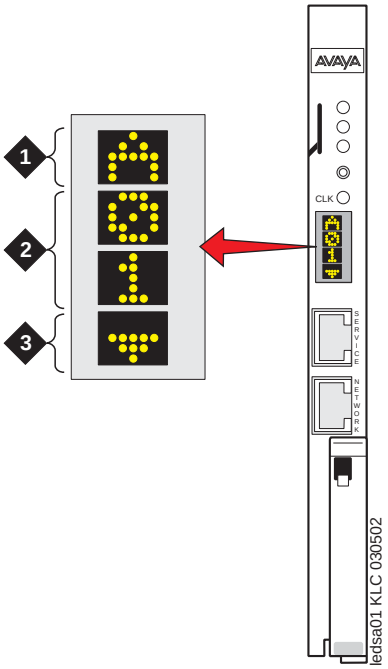


Figure notes

1 Switch identifier

2 Cabinet

3 IPSI has connectivity and an IP address

655A Power Supply LEDs

The G650 media gateway normally has two 655A power supplies. Each has a set of five LEDs, the function of which is indicated in Table 11, 655A Power Supply LEDs, on page 39.

Table 11: 655A Power Supply LEDs

LED	Color	Function
1	Red	Failure of power supply or fan
2	Yellow	Status of power supply OK
3	Green	AC input voltage applied
4	Green	DC input voltage applied
5	Green	Power supply providing ring voltage

Normally the ring voltage LED (#5) on the left power supply is ON and the ring voltage LED on the right power supply is OFF. This changes momentarily when the ringer interchange test is run. The ring voltage LED will only remain lit on the right power supply when there is a power supply failure of the left hand supply or the left hand supply is removed.

LED indicators of serial bus commands to the power supply

Operation of the 655A power supply LED indicators for visual indication of serial bus commands to the power supply for power supply shutdown and ringing shutdown are described below.

Power supply shutdown

The 655A power supply can be commanded off for a period selectable from 1 to 255 seconds. The intent is to allow a hard reset to the G650 chassis remotely. The yellow LED indicating correct operation of the 655A power supply is on for normal power supply operation. When the power supply is commanded off, the yellow LED blinks at a rate of 1 second on and 100ms off, indicating that the power supply is operational but commanded off by the serial bus.

Ringing shutdown

The left hand power supply in the G650 cabinet is the master ringer. If the master ringer fails, ringing is transferred to the redundant power supply, if present, and the red LED on the left hand power supply turns on and the yellow LED turns off, indicating failure of the power supply.

The serial bus can command the ringer off for a period of 1 to 255 seconds. The purpose of this command is to verify redundant ringer operation through the serial bus, remotely from the G650 chassis. The red LED blinks at a rate of 1 second on and 100ms off, indicating that the power supply is operational but commanded off by the serial bus.

A second command relating to ringer operation is the to command the master ringer off, which shuts down the master ringer and transfers control to the redundant power supply. This command is used to permanently transfer ring voltage to the redundant power supply through the serial bus, in order to resolve a problem with the master ringer. The red LED blinks at a rate of 1 second on and 100ms off, indicating that the power supply is operational but commanded off by the serial bus.

Duplication memory card LEDs

The Duplication memory card has LEDs that indicate active/standby, fiber link integrity/activity states. Also see System shutdown LEDs on page 42.

Testing the Duplication Memory card LEDs

When you test the LEDs, the DAJ-1 duplication memory card LED should blink according to the following pattern:

1 second red, 1 second red off, 1 second green, 1 second green off

and so on for a total of one minute.

If the LED shows any of the following flashing patterns, an abnormal condition is indicated. Table 12, Duplication memory card abnormal LED conditions, on page 41 describes the condition and suggests actions to take to resolve it.

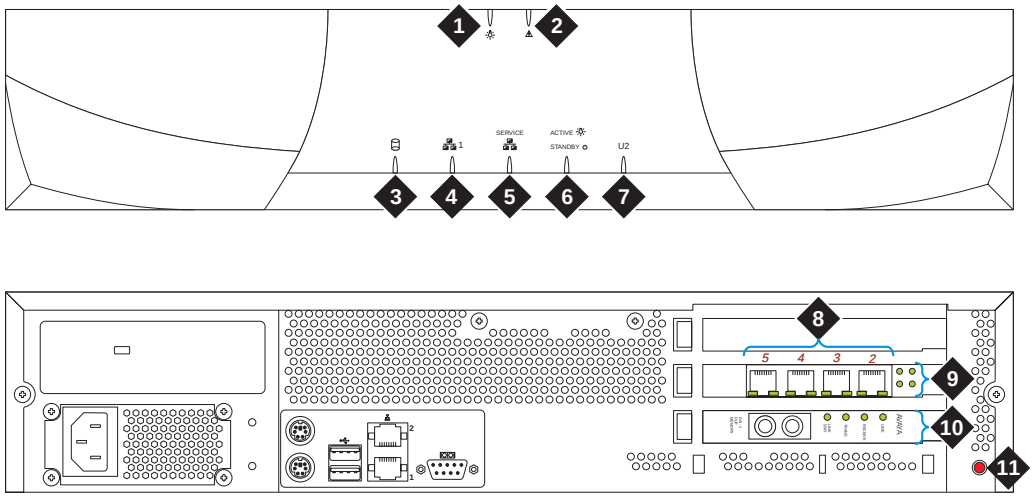
Table 12: Duplication memory card abnormal LED conditions

LED Color	Behavior	Indication	Resolution
Red	Flashes 1 second, off 3 seconds in a repeating pattern	The green element is burned out	Replace the server.
Green	Flashes on 1 second, off 3 seconds, in a repeating pattern	The red element is burned out	Replace the server.
	LED remains off continuously	The DAJ-1 card is not getting power, or the server is hung	If the server is hung, it should automatically reboot itself. If it does not, power it down and reboot it.
Green or Red	Flashed continuously	The server is hung	If the server is hung, it should automatically reboot itself. If it does not, power it down and reboot it.

S8700 Media Server LEDs

The S8700 Media Server has an LED called Active/Standby that indicates whether the server is the active server or the standby server. The Active/Standby LED in the “on” state implies active and in the “flashing” state implies standby. It flashes at the rate of 400 ms “on” and 600 ms “off” when in standby mode.

Figure 9: S8700 Media Server LEDs—Front and Back



scdlled KLC 030502

Figure notes

1	Power	**7**	U2 (not used)
2	Configuration fault	**8**	4 NIC ports (the numbers indicate their assigned Ethernet ports)
3	Disk activity	**9**	LEDs for the NIC ports
4	Network activity (not used)	**10**	LEDs for fiber optic duplication connectivity
5	Service—configuration health (not used)	**11**	Status LED (not used)
6	Active or standby mode indicator		

System shutdown LEDs

All server and Avaya duplication memory card LEDs are in the “off” state but still powered “on” when the server is shut down.

Testing server LEDs

Using the media server Web interface, click **Diagnostics > Test Server LEDs** to make sure that the Active/Standby LED on the server and the transmit LED on the DAJ1 duplication memory card are controllable and not burned out, and that the server is not hung.

During the test, the Active/Standby LED on the media server and the transmit LED on the duplication memory card should blink slowly (1 second on, 1 second off) for 1 minute.

To test the server LEDs:

1. On the main menu, under **Diagnostics**, click **Test Server LEDs**.
2. On the **Test Server LEDs** screen, click **Test LEDs**.
3. Observe the Active/Standby LED on your server and the transmit LED on your duplication card to ensure they are blinking.

Interpreting the test results

An abnormal condition is indicated if an LED shows any of the following flashing patterns.

LED color / behavior	Indication
Flashes **red**	The green element is either burned out or not controlled.
Flashes **green**	The red element is either burned out or not controlled.
Flashes between **red** and **amber**	The green element is stuck on.
Flashes between **green** and **amber**	The red element is stuck on.
Stays **amber** continuously	Either the server is hung or the LED controller is stuck.
Stays off continuously	The server is hung or powered off, the controller is stuck, or the server is using a new or different LED controller.

Also see Testing the Duplication Memory card LEDs on page 41.

Resolving problems

If the server is hung, you do not need to do anything. It should automatically reboot and fix itself. If the server does not reboot itself, power it down and then reboot it.

If an LED is clearly stuck or has a burned out element, ignore the indicators until you can conveniently replace the server.

S8500 Media Server LEDs

The S8500 Media Server has:

- Five (5) LEDs on the front panel (Figure 10, S8500 front panel, on page 44)
- Four (4) LEDs on the back (Figure 11, S8500 rear panel, on page 44)

Figure 10: S8500 front panel

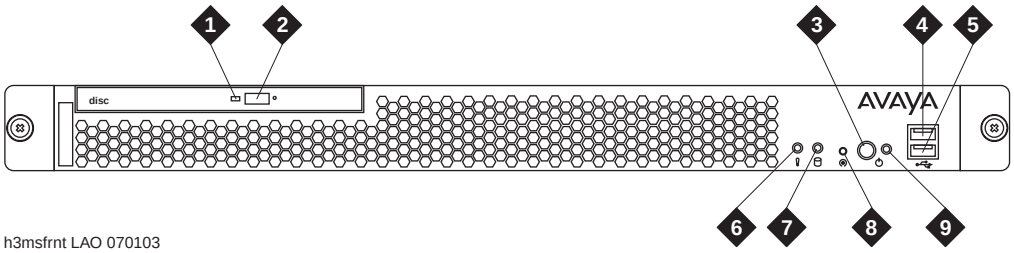


Figure notes

1	CD-ROM drive activity LED (green)	**6**	System-error LED (amber)
2	CD eject button	**7**	Hard disk drive activity LED (green)
3	Power-control button	**8**	Reset button
4	USB connector 1	**9**	Power-on LED (green)
5	USB connector 2		

The four LEDs on the S8500 back panel are shown in Figure 11, S8500 rear panel, on page 44.

Figure 11: S8500 rear panel

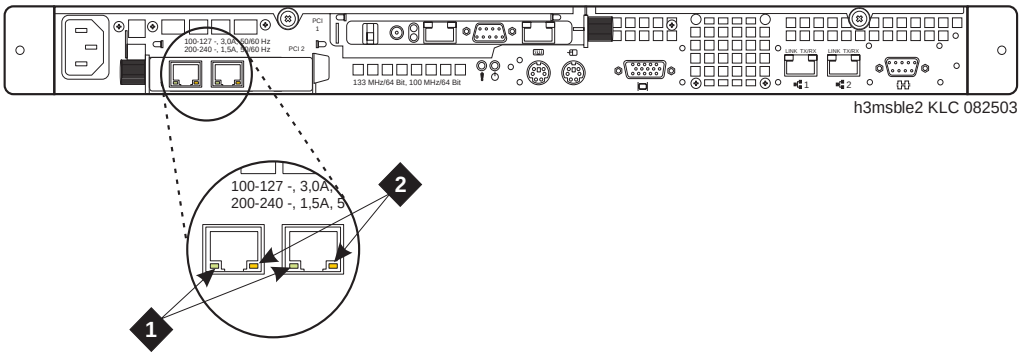
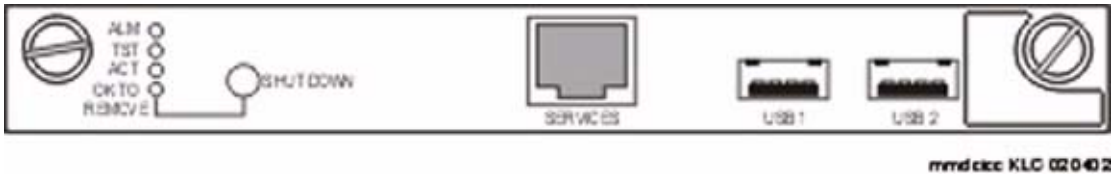


Figure notes

1	Activity	**2**	Connection speed • LED is off: there is a 10 BASE-T active link. • LED is green: there is a 100 BASE-T active link. • LED is orange: there is a 1000 BASE-T active link.

S8300 Media Server LEDs

Figure 12: S8300 Media Server



The S8300 Media Server has a total of 6 LEDs on the faceplate (Figure 12, S8300 Media Server, on page 45), the three standard LEDs and three additional LEDs:

- A fourth LED labeled “OK-to-Remove”, which indicates when the S8300’s disk is properly shut down.
- Fifth and sixth LEDs, located on the lower left and right sides, respectively, of the Services Port, which indicate whether or not data is being sent over the RJ45 jack, and the data rate.

GREEN “OK-to-Remove” LED

The S8300 has a hard drive that must be shut down prior to removal of the S8300. Initiate a shutdown process by first depressing the shutdown button located next to the fourth GREEN “Ok-to-Remove” LED for 2-4 seconds (specific to the S8300). The GREEN LED will first blink; then go steady. Once steady, the GREEN LED indicates that the disk drive has been shut down properly and the S8300 is ready to be removed. Follow standard Media Module removal procedures after the GREEN LED indicates that the disk drive has been properly parked.

There are three different ways that you can properly shut down the S8300 before it is removed:

- Press the shutdown button on the faceplate for 2-4 seconds.
- Initiate shutdown via the Web interface with a computer connected either:
  - Remotely, on the customer’s LAN
  - Locally, on the S8300 using the Services Port on the faceplate of the S8300

GREEN or YELLOW Services Port LEDs

One LED is located on the lower left side of the Services port. It indicates the data rate of the connection:

- When GREEN, this LED indicates a 10MB connection.
- When YELLOW, this LED indicates a 100MB connection.

A second LED, located on the lower right side of the Services port, indicates whether or not data is being sent over the RJ45 jack. This LED serves as a visual status of the Services’ Ethernet interface (TX/RX).

S8300 LED differences from Media Modules

Certain behaviors of the traditional S8300 LEDs differ from the Media Modules because the S8300 is a Media Server running Communication Manager.

- Situations like “insanity” and IP concepts of “registered” through H.248 do not necessarily apply to other Media Modules.
- The RED LED provides a major alarm indication. Software turns off the RED LED during system startup. After startup, software turns on the RED LED whenever a major alarm is present, and turns off the RED LED whenever a major alarm clears. Since the S8300 sees a major alarm whenever a G700 Media Gateway becomes unregistered, this means the RED LED turns on. If the Media Gateway subsequently becomes registered, the major alarm clears, and the RED LED turns off.

  NOTE:
  For an S8300 configured as an LSP, the converse is true. If a G700 Media Gateway registers with an LSP, a major alarm is generated, and the RED LED turns on. When the Media Gateway unregisters, the RED LED turns off.

  The RED LED can be turned on by software to report an application or other error. The RED LED can also be turned on by a hardware watchdog that has not been cleared for at least 10ms, when the processing complex has ceased to function.
- The GREEN LED provides self-testing and maintenance indication.
- The YELLOW LED provides active “in use” indication. For an S8300, the software turns on the YELLOW LED during system startup, and turns off the LED during shutdown. During normal call processing operation, the YELLOW LED turns on whenever a G700 Media Gateway, an IP station, or an IP console is registered with the S8300. Likewise, it turns off when none of the IP endpoints are registered.

Table 13, Major alarm (red LED), on page 47 through Table 17, ENET Link/Activity (green LED), on page 48 illustrate the states of S8300 LEDs.

Table 13: Major alarm (red LED)

Major alarm	Indicator
Power on Reset	On
BIOS Boot	On
OS and SW Boot	On
System Up	Off - SW
H.248 Registered	Off - SW
Shutdown in Progress	On
Shutdown Complete	On

Table 14: Test – To Be Defined (green LED)

Test – To Be Defined	
Power On Reset	Off
BIOS Boot	Off
OS and SW Boot	On-SW
System Up	Off - SW
H.248 Registered	Off - SW
Shutdown in Progress	Off - SW
Shutdown Complete	Off

Table 15: Active – In Use (yellow LED)

Active – In Use	
Power On Reset	Off
BIOS Boot	Off
OS and SW Boot	Off
System Up	SW
H.248 Registered	On-SW
Shutdown in Progress	Off-SW
Shutdown Complete	Off

Table 16: OK to Remove (green LED)

OK to Remove	
Power On Reset	Off
BIOS Boot	Off
OS and SW Boot	Off
System Up	Off
H.248 Registered	Off
Shutdown in Progress	1 Hz flash
Shutdown Complete	On

Table 17: ENET Link/Activity (green LED)

ENET Link/Activity	
Power On Reset	Off
BIOS Boot	N/A
OS and SW Boot	N/A
System Up	Link Status
H.248 Registered	Link Status
Shutdown in Progress	Unknown
Shutdown Complete	Off

S8300 LED lighting sequence

In general, S8300 LEDs light in order from top to bottom, then from left to right on the S8300 faceplate.

The following order applies during restart or boot of the S8300:

1. ALM - RED: lights up first then turns off.
2. TST - GREEN: lights up second then turns off.
3. ACT - YELLOW: lights up third then turns off.
4. OK To REMOVE - GREEN: lights up fourth then turns off.
5. LEFT LED in SERVICES jack - GREEN (10 MB link speed): lights up fifth then turns off.
6. LEFT LED in SERVICES jack - YELLOW (100 MB link speed): lights up sixth then turns off.
7. RIGHT LED in SERVICES jack - GREEN: lights up seventh then turns off.

S8100 Media Server LEDs

This section describes the location and interpretation of LEDs for the S8100 media server. The S8100 LEDs indicate the status of various maintenance components in the S8100 system. LEDs are located on:

- The attendant console
- All circuit packs in the switch cabinets
- Customer-designated voice terminals (option)

The following LEDs are included in the system:

- TN2314 processor circuit pack LEDs
- Attendant console LEDs
- Circuit pack status LEDs
- Power supply LEDs
- LED Usability Enhancements

TN2314 processor circuit pack LEDs

The front pane has two groups of LEDs. One group indicates the status of the pack, and the other group (which includes the Major, Minor, and Warning alarms described in the Alarm levels section) reflects maintenance conditions in the entire system. See Figure 13, LED indicators on the TN2314 processor circuit pack, on page 53 and Table 18, TN2314 processor circuit pack LEDs, on page 50.

NOTE:
Alarms on the SW-CTL, PKT-INT, PR-MAINT, TRAN-STO, PR-TN-BD, TONE-PT, TDM-CLK, PR-SSP and PR-ADX maintenance objects are indicated by the red LED on the Processor circuit pack.

Table 18: TN2314 processor circuit pack LEDs

Red (alarm)	Alarm--The system has detected a fault in this circuit pack
Green Test	Test--the system is running tests on this circuit pack
Amber	Handshake--In an operating system, this LED indicates that the handshaking between the firmware and the Windows 2000 operating system is occurring by flashing briefly once every 10 seconds
Amber	PCMCIA--The flash disk is in use
Red	Major Alarms
Red	Minor Alarms
Amber	Clock--Blinks every 4 seconds
Red	EX-MFR-- Indicates emergency transfer has been invoked
Green	OK Remove--Indicates that it is OK to remove the TN2314 processor circuit pack

NOTE:
If the AC power cord is unplugged, the emergency transfer feature invokes, however the EMERGENCY TRANSFER LED (red) is not lit due to loss of AC power.

WARNING:
DO NOT REMOVE the TN2314 circuit pack unless the ***OK to REMOVE*** LED is illuminated. Failure to heed this warning may result in loss of data and/or damage to equipment.

WARNING:
When the TN2314 is replaced, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*.

Table 19, TN2314 circuit pack states, on page 51 summarizes the TN2314 circuit pack LED states.

Table 19: TN2314 circuit pack states

		Boot Sequence = 3 min, 45 sec								Shutdown Sequence		Other	
LED name	**LED color**	**Power-on reset**	**860 core test in progress**	**860 core test finished, RM initialized**	**PC BIOS boot**	**PC OS boot**	**Firmware download**	**Jump to application firmware**	**SPE up**	**Shutdown in progress**	**Shutdown complete**	**860 core test failed**	**Pentium BIOS update**
TN2314 CPA Alarm	red	on	on	Racing LEDs	on	on	on	Racing LEDs	sw	on	on	on	on
TN2314 Test	green	off	on		flash1	flash3	off		sw	sw	off	on	flash2
TN2314 In Use	yellow	off	off		off	off	flash2		flash4	sw	off	on	flash2
PCMCIA	yellow	on	on		sw	sw	sw		sw	sw	on	off	on
Major Alarm	red	off	off		off	off	off		sw	sw	off	off	off
Minor Alarm	red	off	off		off	off	off		sw	sw	off	off	off
Clock Status	yellow	off	off		off	off	off		clk	clk	off	off	off
ETR	red	on	on		on	on	on		sw	sw	on	on	on
OK to Remove	green	off	on		on	off	off		off	flash3	on	on	off
————	———	———	(a)_ _ 40 sec.		(b) 40 sec.	(c) 80 sec.	(d) 30 sec.	(e)					

flash1— 800ms ON, 200ms OFF
flash2— 500ms ON, 500ms OFF
flash3— 200ms ON, 800ms OFF
flash4— 200ms OFF on every sanity heartbeat
flash5— 1 sec ON, 1 sec OFF

sw— Software Controlled
clk— Similar to the TN2182 Tone/Clock LED

NOTE:
When system status is “up” you will go through stat 1-8. After 8, S8100 will start up in 20 seconds and you should be able to dial. INTUITY AUDIX continues to initialize for about 5 minutes.

Sequence Legend:

1 Power-on reset.

2 860 Core test in progress. Testing ROM, RAM, 860, etc. (usually lasts about 35 seconds).

3 860 Core test finished successfully. Remote Maintenance (RM) initialized.

4 Pentium released from reset. Waiting for Windows 2000 to start booting.

5 Booting Windows 2000.

6 Booting PC operating system. Waiting for application firmware download.

7 Jump to application firmware. Remote maintenance initialized (this time in application firmware).

8 SPE is up. The TN2314 circuit pack In Use yellow LED turns off for 200ms every time (approximately every 10 seconds) firmware receives handshake from software. This is the heartbeat that software and firmware is alive and talking. S8100 software starts up.

9 Shutdown is in progress. It’s OK to Remove green LED flashes. Don’t remove the circuit pack yet.

10 Shutdown is complete. It’s safe to remove the circuit pack.

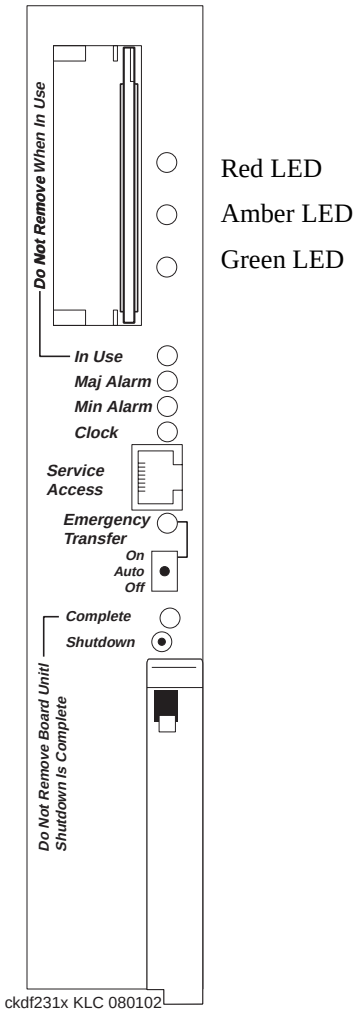
11 860 Core test failed. Try power cycling the circuit pack. Replace circuit pack if it keeps failing.

12 Pentium BIOS update mode is activated.

13 Entering factory diagnostic mode. Wait about 35 seconds for 860 Core test to finish.

In factory diagnostic mode.

Figure 13: LED indicators on the TN2314 processor circuit pack



Attendant console LEDs

The console has two red LEDs, labeled ALM and ACK. The left LED lights steadily when there is a Major or Minor alarm at the switch cabinet. The right LED lights steadily if the alarm has been successfully reported to INADS. If the system is unable to report the alarm to INADS, the LED flashes, signaling the attendant to call INADS and report the alarm.

Circuit pack status LEDs

Each circuit pack has three LEDs on the front panel visible at the front of the carrier. On all circuit packs, except the 650A Power Unit, the LEDs indicate:

1 Red (alarm) — If the circuit pack is communicating with the system, the system has detected a fault in this circuit pack. An on-board alarm for this circuit pack is displayed in the Alarm Log.

The circuit pack also lights this LED when either the circuit pack has not yet initialized communication with the system or when the circuit pack loses contact with the system and stops functioning (circuit pack is said to be “in reset”). In these cases, there may not be an alarm in the Alarm Log. To determine if the red LED is lit because the circuit pack is not in contact with the system, issue the **list configuration board *location*** command, where ***location*** refers to the slot containing this circuit pack. If the system does not detect the circuit pack, this command returns `Identifier not assigned` or `no board`.

If the circuit pack has just been inserted, the system may still be initializing the circuit pack. If, after 5 minutes, the circuit pack still has not initialized communications with the system, check the MO for any special instructions (for example, EPN Maintenance circuit pack can stop EXP-INTF circuit pack from initializing). If the MO does not provide the needed information, perform the following steps:

- Check the Error Log for TONE-BD and TDM-BUS errors. Enter **test tdm *P*** where ***P*** is the port network containing the relevant slot. Refer to Restarting Non-Functioning Port Circuit Packs in the general description of the TDM-BUS (TDM Bus). Enter **test tone-clock PC**, where P is the network containing the relevant slot, and C is the carrier containing the relevant slot. Follow appropriate sections for any TONE-BD and TDM-BUS errors.
- Reseat the suspect circuit pack.

WARNING:

Reseating the TN2314 may be very destructive.

WARNING:

When the TN2314 is replaced, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*.

- Wait 5 minutes. Then issue the **list configuration board *location*** command. If the result indicates that the system still has not registered the circuit pack, go to next step.
- Try to insert the circuit pack into a different slot and try to insert a different circuit pack into the suspect slot (provided the maintenance documentation for this circuit pack does not warn against either of these actions).
- If the system seems to be functioning correctly, but the circuit pack does not start communicating with the system, replace the circuit pack.

2 Green (test) — the system is running tests on this circuit pack.

3 Yellow (busy) — indicates that the circuit pack is in use.

NOTE:

A port circuit pack also lights its red LED when it performs initialization tests (for example, when the circuit pack is initially inserted into the system). If all initialization tests pass, the red LED is turned off. If any initialization tests fail, the red LED remains lighted and the circuit pack is not placed into service.

During the various states of operation (start-up testing, normal operation, circuit failure, and so forth) circuit pack status LED indications appear as shown in Table 20, Control and port circuit pack status LEDs, on page 55.

Table 20: Control and port circuit pack status LEDs

Equipment type	LED	Description
Port Circuit Packs	Red	Briefly on during power up, circuit pack reseating, resetting, and system reset. Steadily on if circuit pack fails start-up test or fails while in use. Off during normal operation.
	Green	Briefly on during circuit pack testing following power up, circuit pack reseating, and system reset. On during periodic, scheduled, and system technician demanded testing. Off during normal operation.
	Yellow	On when any port in the circuit pack is in use, otherwise, off.
Control Circuit Pack	Red	Briefly on during power up and system reset. Steadily on if circuit pack fails start-up test or fails while in use. Off during normal operation.
	Green	On briefly during board testing following power up and system reset. Also on during periodic, scheduled, and system technician-demanded testing. Off during normal operation.
	Yellow	Processor • Lit during processor initialization • Lit during system initialization (stays lit until Emergency Transfer is turned off) Tone Detector/Generator • Slow blinking when clock is in use • Otherwise, off

Power supply LEDs

Table 21, LED and alarm conditions, on page 56 shows the LED and alarm conditions for the 650A Power Supply. Ring voltage and neon bus output do not activate alarm status.

Table 21: LED and alarm conditions

Condition	LED status	Alarm state	Fan alarm
Normal	Red off; Yellow on	Open	Normal
No input power	Red off; Yellow off	Closed	No input power
DC output not present (except Neon)	Red on; Yellow off	Closed	DC output not present (except Neon)
Fan alarm	Red on; Yellow on	Closed	Fan alarm

LED Usability Enhancements

LED enhancements have been added for two new events:

- ‘860 Core Test
- SPE Down

‘860 Core Test (done at powerup/board insertion)

The Major Alarm (red), Minor Alarm (red), and Tone Clock (yellow) LED’s now scroll to show activity during core test. When the core tests have finished, the LED trio flashes twice.

The ‘860 Core Test consists of the following:

- ‘860 registers (R0-R31) test (very fast)
- Permanent boot code checksum test (fast)
- 16MB SDRAM pattern test (very slow. The LED trio scrolls one step every time 1 MB of SDRAM has been tested)
- 16MB SDRAM address test (slow. The LED trio scrolls one step for this test)

Seventeen “scrolls” of the LEDs should occur during the core test before the double flash. This activity gives some feedback to the user that something is going on.

SPE Down

The Major Alarm (red) LED now flutters. This is very noticeable, and should help in determining when the board is in an SPE Down condition. Each time an SPE Down condition occurs, the following steps take place:

- SPE Down #1 -- A message is logged in firmware, and the platform reboots (tries to bring the platform up automatically)
- SPE Down #2 -- A message is logged; INADS dialout; SPE Down 7 min. waiting period
- SPE Down #3 -- A message is logged; INADS dialout (if not already done before); SPE Down 7 min. waiting period
- SPE Down #4 -- A message is logged; INADS dialout (if not already done before); SPE Down 46 min. waiting period (that's 46 minutes)

The process then repeats at SPE Down #1.

NOTE:
Removing/reinserting the TN2314 circuit pack resets the SPE Down count back to zero.

G700 and Media Module LEDs

LEDs are important status indicators for technicians during on-site installation, maintenance, troubleshooting, and repair. They encompass three major areas: Alarms, Testing, and Usage Activity. Some LEDs are specialized to support specific procedures (such as removing the S8300 Media Server). When alarms or problems occur, LEDs are present to indicate that attention by a technician is needed.

LEDs appear on the G700 LED panel, and each Media Module. The G700 LEDs are the same as those on the Avaya Cajun P330, with the following exceptions:

- Slight modifications to two of the LEDs (OPR and SYS)
- Addition of the Alarm LED to the LED Panel to display prominently any error condition

See *"Table 2-1: Avaya P333T LED Description*, in the *"Avaya P333T User's Guide"* for a complete listing of LEDs.

Some Media Modules have additional LEDs, although each Media Module has the three standard LED. Table 22, LED Interpretation, on page 57 indicates the meanings associated with standard DEFINITY server LEDs. Although in some cases these LEDs have been augmented or modified for the S8300 Media Server and G700 Media Gateway, it is important to be aware of their standard meanings when viewing the system.

Table 22: LED Interpretation

Red	Upon power-up or module insanity, this LED is turned on. Upon passing diagnostics, this LED is turned off.
Green	During power-up self testing and maintenance testing, this LED is turned on.
Yellow	This LED indicates that the module is in service.

NOTE:
The four multi-color specialized status LEDs that have appeared on various DEFINITY server TN boards like the T1/E1/DS1 board (TN464F) do not appear on the Media Modules.

NOTE:
LEDs can also be viewed using the embedded Device Manager on the L2 Switching Processor; however, it displays LED position only, and does not indicate status.

LED panel location on the G700

As shown in Figure 14, G700 LED Panel Location, on page 58, the LED panel is located on the top left corner of the G700. Directly below the LED panel is Media Module slot V1, which can be occupied by any type of Media Module. However, the S8300 Media Server can reside only in this particular slot because of height restrictions (for a specific discussion of the S8300 LEDs, see S8300 Media Server LEDs on page 45.

Figure 14: G700 LED Panel Location

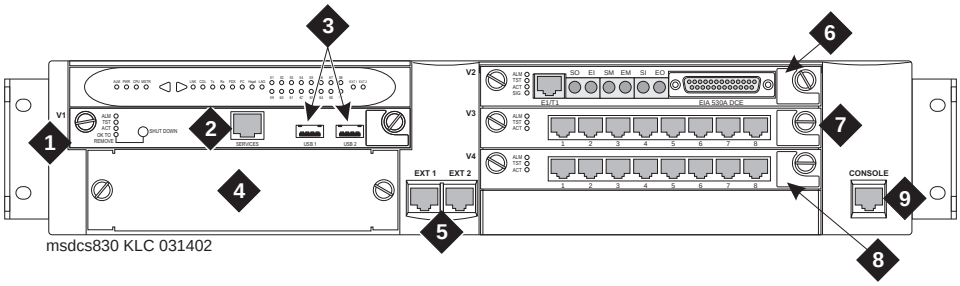
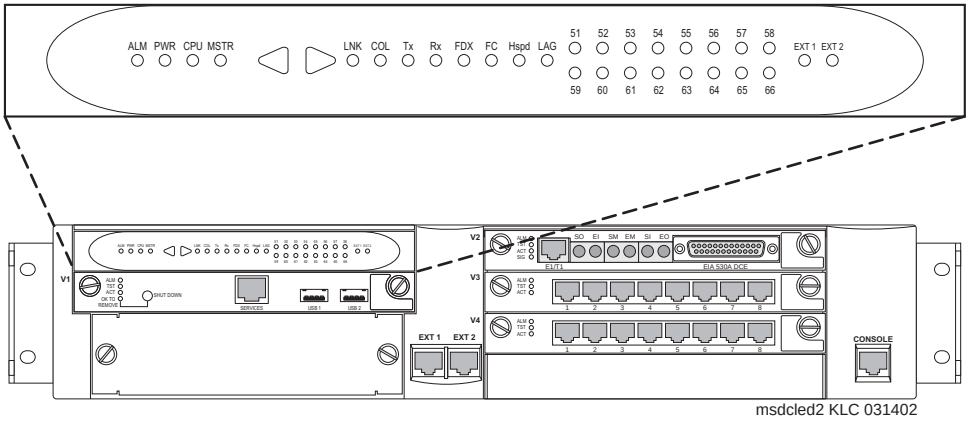


Figure notes

1	Media Module Slot #1 (V1)	**5**	10/100 Base-T Ethernet Ports (Ext1, Ext2)
2	S8300 Services Port (Used with cross-over ethernet cable)	**6**	Media Module Slot #2 (V2)
3	S8300 USB-Series Modem connection	**7**	Media Module Slot #3 (V3)
4	Avaya Expansion Module Slot	**8**	Media Module Slot #4 (V4)
		9	Console Interface (use with serial cable)

Figure 15, G700 LED Panel, on page 59 shows an expanded view of the G700 LED panel.

Figure 15: G700 LED Panel



Front panel LEDs

The front panel includes the following LEDs (Figure 16, G700 Front Panel LEDs, on page 59):

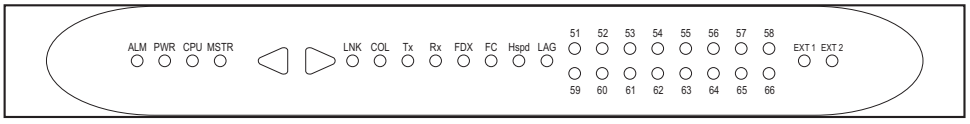
- 4 LEDs in Voice/Data Module zone (ALM, PWR, CPU, MSTR)

  NOTE:
  The LEDs labeled OPR and SYS on the P330 are labeled CPU and MSTR, respectively, on the G700.

- 16 LEDs representing the Data Ports associated with the Personality Module or Data Expansion Ports
- 8 LEDs in Data Function zone (LNK, COL, Tx, Rx, FDX, FC, Hspd, LAG)
- 2 LEDs (EXT 1 and EXT 2) for two 10/100 Mb data ports on the chassis

  NOTE:
  The four LEDs (ALM, PWR, CPU, MSTR) are positioned as closely as possible to the top left corner of the LED Panel so that important motherboard-related information can be quickly located by the service technician.

Figure 16: G700 Front Panel LEDs



A total of 30 LEDs appear on the LED Panel for the G700. The following three LEDs have been added to the Avaya Cajun LEDs (see *"Avaya P330 Manager User Guide")*:

- RED ALM or Alarm LED
- EXT 1 LED
- EXT 2 LED

The G700 MSTR LED differs from the Avaya Cajun LED in that the bottom G700 in a stack of 10 G700s with the same version firmware is always elected master (therefore, its MSTR light is lit). But, if the firmware versions are not the same, the G700 with the latest firmware version is elected master and its MSTR light is lit. If there is only one G700 in a stack, its MSTR light is always lit.

Navigating using the front panel LEDs

Navigation using the front panel LEDs on the G700 is that same as with the Avaya Cajun P330 series. *"Table 2-2: Avaya P330 <--> Select buttons, in the "Avaya P333T User's Guide"*. For example, a technician can use the arrows to move left and right between the LEDs, and check the following:

- LNK (link)
- Col (collision)
- Tx (send)
- Rx (receive)

In addition, a technician can query the status of the ports using 51-66 in the LED panel.

Use the push buttons (on the right and left of data mode LEDs) for selecting the function to be reported simultaneously by all 16 of the Port data expansion LEDs. The function you are selecting is indicated by a lightened LED in that Function zone. Each time you press on the right (or on the left) push-button, the function currently lighted moves by one to the right (or to the left) accordingly.

For example, if the COL LED is lit, all 16 Ports associated with the data expansion module LEDs are reporting the Collision status of their respective port. If you want to select the LAG function, press 6 times on the right push-button. Afterwards, if you want to select the Rx function, press 4 times on the left push-button.

For the G700, the LEDs display the information of ports 2 External 10/100Base-T Ethernet links and data expansion ports 51-66. At power up the LEDs indicate the Link status of ports 51-66 and ext 1 & ext 2. Push the right button once to move the indication to Collision status of ports 51-66 and ext 1 & ext 2. Push the left button to move the indication backwards.

NOTE:
Eight pushes in one direction complete a full cycle of display.

If you press the right and the left pushbuttons simultaneously for:

- 1.5sec, the module resets the Layer 2 Switching Processor but not the Media Gateway Processor
- 4 sec, the whole stack resets (performing slot renumbering)
- 18sec, the module enters the debug mode – module disabled for data traffic

NOTE:
Currently, there is no physical button or sequence of button presses defined to reset the Media Gateway Processor or G700. Complete software resets by using the Command Line Interface (CLI) for the Device Manager of the G700.

RED ALM or Alarm LED

The RED ALM or Alarm LED is on the top-left most corner of the LED Panel next to other important system LEDs (PWR, CPU, MSTR), as specified in Figure 16, G700 Front Panel LEDs, on page 59. The presence of this RED ALM LED is primarily for on-site service technicians or dispatches. It alerts technicians of major failures that require a physical replacement or removal of equipment. Most major G700 components controlled or monitored by the motherboard can be a cause of illumination. This includes the Avaya VoIP Media Module, but not other Media Modules.

NOTE:
The RED ALM LED lights for motherboard problems only. Check for a RED ALM LED for problematic G700s and also check all of the Media Module LEDs for any Media Module specific RED ALM LEDs.

NOTE:
If the RED ALM LED is lit on a non-VoIP Media Module, check the G700 alarm screens and the Avaya Communication Manager alarm screens to determine where the fault lies.

The RED ALM LED indicates the health of the G700 by lighting under two distinct circumstances:

- G700 hardware failure
  - Impaired functions of the Layer 2 Switching Processor, Media Gateway Processor, or VoIP engine
  - Power supply voltage out of bounds
  - Unit overheating
- The G700 cannot communicate to any server

The following are a few examples:

- The RED ALM LED is lighted when two or more fans have failed.

  Various warnings, alarms, and a graceful shutdown are performed based on the fan and thermal sensor conditions.
- The RED ALM LED is lit from the time power is applied until diagnostics end.
- The RED ALM LED turns “OFF” when:
  - Physical conditions such as temperature are rectified and return to normal or acceptable operating ranges.
  - The alarm is cleared manually.

EXT 1 LED

EXT 1 LED appears on the LED Panel (Figure 16, G700 Front Panel LEDs, on page 59), which reports the status of the first 10/100 MB/sec port (these LEDs report the 8 different functional statuses dictated by the left and right arrow buttons).

EXT 2 LED

EXT 2 LED appears on the LED Panel (Figure 16, G700 Front Panel LEDs, on page 59), which reports the status of the second 10/100 MB/sec port (these LEDs report the 8 different functional statuses dictated by the left and right arrow buttons).

G700 LED panel definitions

Table 23, LED Definitions, on page 62 illustrates the LED definitions for the G700 LED Panel.

Table 23: LED Definitions

No.		LED Name	Description	LED States
1		ALM	Alarm Status Color is RED	OFF - No alarms exist ON (RED) - Alarm exists on the chassis itself
2		PWR	Alarm Status Color is GREEN	OFF - Power is down ON - Power is up Blinking - every 1.2 seconds (400ms on, 800ms off) when 5 volts power is not available to the riser board and the Media Modules
3		CPU	CPU Operation Color is GREEN	OFF - CPU is in boot operation or is running BIST ON - CPU boot operation and BIST completed
4		MSTR	Master/Slave Status Color is GREEN	OFF - Slave box of the stack ON - Master of the stack and redundant cable is not present or not active 1 Blink every 1.5 sec - Master of the stack and active redundant cable
5	a	LNK port 51-66, Ext 1-2	Port Status Color is GREEN	OFF - Port disabled or not existent. At phase 1, or link fail of Giga ports. ON - Port is enabled and link is OK. 1 Blink every 1.5 sec - Link test fail (of 10/100M ports only at phase 1) 2 Blinks every 1.5 sec - Partition
	b	COL Port 51-66, Ext 1-2	Collision (GREEN)	OFF - No collision or FDX port ON - Collision occurred on line
	c	Tx Port 51-66, Ext 1-2	Transmit to line (GREEN)	OFF - No transmit activity ON - Data transmitted on line
	d	Rx Port 55-66, Ext 1-2	Receive from line (GREEN)	OFF - To receive activity ON - Data received from the line
	e	FDX Port 51-66, Ext 1-2	Half/Full Duplex (GREEN)	OFF - Half Duplex mode of operation ON - Full Duplex mode of operation, or for 10/100Base-T ports when link test fail with auto-negotiation enabled

1 of 2

Table 23: LED Definitions

No.	LED Name	Description	LED States
f	FC* Port 51-66, Ext 1-2	Symmetric Flow Control (GREEN)	OFF - Port is in an Asymmetric Flow control mode, or in Flow Control mode disabled, or it is in half duplex ON - Port is in full duplex and in a symmetric Flow Control mode
g	HSpd Port 51-66, Ext 1-2	High Speed (GREEN)	OFF - 10Base-T or for an expansion port that does not exist ON - 100Base-T, 100Base-F, 1000Base-X, and OC-12, or for 10/100Base-T ports when link test fail with auto-negotiation enabled
h	LAG Port 51-66, Ext 1-2	Link Aggregation "Trunking" (GREEN)	OFF - No LAG defined with this port ON - Port belongs to a LAG
6	Data	16 data expansion ports 51-66 (GREEN)	OFF - see notes on No. 5 a-h ON - see notes on No. 5 a-h
7	EXT 1	RJ 45 to Non-Avaya equipment (GREEN)	OFF - see notes on No. 5 a-h ON - see notes on No. 5 a-h
8	EXT 2	RJ 45 to Non-Avaya equipment (GREEN)	OFF - see notes on No. 5 a-h ON - see notes on No. 5 a-h

* For Giga ports, when auto-negotiation is enabled and the link is down, FC LED reflects the last mode

If the user resets the module/stack, then all of the module's/stack's LEDs light on (test lamp) for 150ms. The COL, Tx, and Rx LED signals must be at least 150ms.

2 of 2

Media Module LEDs

Media Gateway physical LEDs provide the technician with information regarding the ability to troubleshoot the Media Module as a whole.

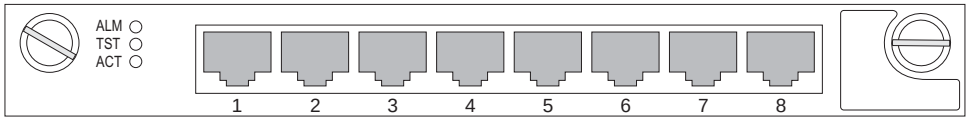
NOTE:
The physical LEDs provide board level status information, while the SAT provides port level status information.

LED Locations on the Media Modules

All Media Modules have three standard LEDs on the faceplate (Figure 17, Faceplate of Media Modules with Standard LEDs, on page 64). On the Avaya VoIP (MM760), Avaya BRI (MM720), Avaya DCP (MM712), and Avaya Analog (MM711) Media Modules, these are the only LEDs present. In addition,

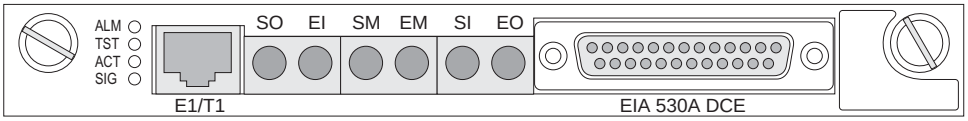
the Avaya T1/E1 Media Module (MM710) has an additional LED, as shown in Figure 18, T1/E1 Media Module with Fourth LED, on page 64.

Figure 17: Faceplate of Media Modules with Standard LEDs



mmdc712 KLC 022702

Figure 18: T1/E1 Media Module with Fourth LED



mmdc710 KLC 020402

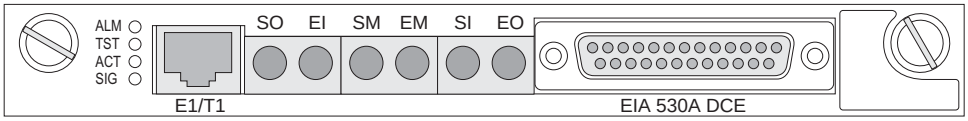
MM710 T1/E1 Media Module LEDs

The T1/E1 Media Module has four LEDs on its faceplate (see Figure 19, T1/E1 Media Module LEDs, on page 65). Table 24, T1/E1 LEDs, on page 64 shows their color and functions. The first three are the standard LEDs, which are under software control.

Table 24: T1/E1 LEDs

Name	Color	Location	Description
ALM	RED	Top	Upon power-up, this LED is turned on. Upon passing diagnostics this LED is turned off. During normal circuit pack operation this LED is not turned on except for certain alarm states.
TST	GREEN	Second	During power-up self-testing and maintenance testing requested by the SPE, this LED is turned on.
ACT	YELLOW	Third	This LED indicates that the clock is synchronized with a source (usually the Central Office). The LED is blinking 2700 ms ON and 300 ms OFF. This is the most common condition. The opposite blinking of the YELLOW LED is 300 ms ON and 2700 ms OFF. This is an error condition, and indicates that the MM710 T1/E1 Media Module is not synchronized with a clock. An infrequent occurrence is a steady YELLOW LED. This indicates in-use activity, only when clock synchronization is set to local.
SIG	GREEN	Bottom	This LED indicates whether the link to the Central Office (CO) is up (equivalent to the TN464F circuit pack Status 3 GREEN LED). See Figure 19, T1/E1 Media Module LEDs, on page 65.

Figure 19: T1/E1 Media Module LEDs



The supported portion of the LED control message allows software to change the status of the three standard LEDs on the T1/E1 Media Module faceplate. Power-up and alarm states are the only conditions where hardware sets the state of the LEDs independent of ANGEL firmware control.The exceptions to letting software turn off the LEDs are:

- The board is in reset (RED ALM LED remains on)
- A call is up (YELLOW ACT LED remains on while the E1 line is in-frame and at least one voice/data call is up)
- During board reset initialization testing (GREEN TST LED remains on until initialization testing is complete)

NOTE:
For ISDN operation, the Yellow LED will be turned on if ANY port has an active TDM connection (including the D-channel).

Synchronization

The YELLOW ACT LED on the front of the MM710 Media Module can tell you the status of that module regarding synchronization.

- If the YELLOW ACT LED is solidly on or off, it has NOT been defined as a synchronization source. If it is on, one or more channels is active. If it is an ISDN facility, the D-channel will count as an active channel and will cause the YELLOW ACT LED to be on.
- When the MM710 is driving a clock sync source line to the G700 main clock, the YELLOW ACT LED does not indicate port activity, but instead indicates that the MM710 is the sync source by flashing with a regular 3-second period:
  - It is on for 2.8 seconds and flashes off for 200 milliseconds if it has been specified as a sync source and is receiving a signal that meets minimum requirements for the interface.
  - If it has been specified as a sync source and is not receiving a signal, or is receiving a signal that does not meet minimum requirements for the interface, then the YELLOW ACT LED will be off for 2.8 seconds and flash on for 200 milliseconds.

T1/E1 Initialization

The T1/E1 Media Module LEDs behave in the following manner during initialization. The Angel provides a visual indication of the Media Module's status through the three faceplate LEDs:

- During initialization the YELLOW ACT LED is held off, while the RED and GREEN LEDs are on during the entire initialization sequence.
- Upon power up or reset, if only the RED ALM LED comes on, the Angel processor is dead or the board is being held permanently in reset.
- Upon completion of the diagnostics and initialization, the GREEN TST LED turns off.

- If the initialization tests fail, the RED ALM LED remains on.
- If the tests all pass, then all LEDs are extinguished until Communication Manager starts using the Media Module.

Operational control

After successful initialization, the T1/E1 Media Module's LEDs are controlled as follows:

- The Angel lights the YELLOW ACT LED when there is at least one non-idle trunk. If Communication Manager sends a message to drive the clock sync signals, the YELLOW ACT LED indicates this instead of the port busy/idle status.
- The Media Server may independently light and extinguish the three LEDs through downlink LED Control messages, subject to the constraint that it may not turn off a YELLOW ACT LED turned on by the Angel as a result of port activity.
- If the Media Module resets for any reason and is not released from reset, the RED ALM LED lights and the YELLOW ACT and GREEN TST LEDs are held off.

3 Server Alarms

S8700 / S8500 / S8300 / S8100

This chapter provides background information on server alarming. For detailed information on G700 Media Gateway Traps, refer to Chapter 4, “G700 Media Gateway Traps”.

Introduction

During normal operations, software or firmware may detect error conditions pertaining to specific Maintenance Objects (MOs) or other subsystems. The system automatically attempts either to fix or circumvent these problems. Errors are detected in two ways:

- Firmware on the component during ongoing operations
- A “periodic test” or a “scheduled test” started by software

  The technician can run tests on demand that are generally more comprehensive (and potentially disruptive) than are the "scheduled tests".

When an error is detected, the maintenance software puts the error in the Error Log and increments the error counter for that error. When an error counter is “active” (greater than 0), there is a maintenance record for the MO. If a hardware component incurs too many errors, an alarm is raised.

Alarms on the Linux media servers can occur in several areas:

- Media Modules, Media Servers, the Media Gateway Processor, and the Layer 2 Switching Processor are all capable of detecting internal failures and generating traps and alarms.
- Media gateways, such as the G700, detect faults and alert the Media Server; the Media Server then raises an alarm, and sends the alarm to an appropriate network management site.
- Communication Manager alarms reflect health status of network elements such as media gateways, circuit packs, media modules, and their associated links, ports, and trunks.
- Messaging alarms provide health status of embedded or external messaging systems.

Alarms may be viewed using the following:

- Maintenance Web Interface

  Provides alarms information related to Communication Manager, the media server, and messaging.

  NOTE:
  For non-Communication Manager alarms, use the Web Page header "Alarms and Notification" and "Diagnostics: View System Log". Choose the appropriate heading and, if necessary, call Avaya support.

- Media Server bash shell

  Provides alarms information related to Communication Manager, the media server, and messaging.

- Media Server SAT CLI

  Provides alarms information related to Communication Manager.

- MGP CLI (on the G700 Media Gateway)

  Provides alarms and traps information related to the G700 platform and its subsystems.

- Layer 2 Switching Processor CLI (on the G700 Media gateway)

  Provides information related to the media gateway stack.

Information related to Communication Manager, the media server, and messaging alarms can be displayed using either the Maintenance Web Interface or the media server bash shell; however, this document (*Maintenance Alarms Reference (555-245-102)*) provides maintenance information only for Communication Manager (Chapter 5, “Communication Manager Maintenance-Object Repair Procedures”)and media server alarms (Chapter 3, “Server Alarms”). For messaging alarms and repair procedures, refer to the appropriate documentation for your messaging system.

Alarm Classifications

Alarms are classified depending on their effect on system operation:

- MAJOR alarms identify failures that cause a critical degradation of service. These alarms require immediate attention.
- MINOR alarms identify failures that cause some service degradation but that do not render a crucial portion of the system inoperable. Minor alarms require attention. However, typically a minor alarm affects only a few trunks, stations, or a single feature.
- WARNING alarms identify failures that cause no significant degradation of service or equipment failures external to the switch. These failures are not reported to INADS or to the attendant console.
- ON-BOARD problems originate in the circuitry on the alarmed Media Module.
- OFF-BOARD problems originate in a process or component that is external to the Media Module.

Background Terms

Table 25, Alarming Background Terms, on page 69 gives a useful explanation of terms.

Table 25: Alarming Background Terms

Term	Explanation
TRAP	A trap is an event notification that is sent to the SNMP trap manager and received from the Media Gateway Processor, Layer 2 Switching Processor, or RTCP Monitor (Avaya VisAbility).
ALARM	Some traps are determined to be an alarm. If determined to be an alarm they are sent to an appropriate alarm management site, such as INADS.
INADS	Initialization and Administration System, a software tool used by Avaya services personnel to initialize, administer, and troubleshoot customer communications systems remotely.
SNMP	Simple Network Management Protocol, the industry standard protocol governing network management and the monitoring of network devices and their functions.
RTCP	Real Time Control Protocol, contained in IETF RFC 1889.
ISM	Intelligent Site Manager, a VPN gateway on the customer's LAN that provides a means for services personnel to access the customer's LAN in a secure manner via the Internet.
VPN	Virtual Private Network, a private data network that makes use of the public telecommunication infrastructure, maintaining privacy through the use of a tunneling protocol and security procedures.

Alarm-Related LEDs

Table 26, Alarm-Related LEDs, on page 70 shows alarm-related LEDs on the faceplate of the G700 or on an attendant console, and shows how certain LEDs reflect specific alarm situations.

Table 26: Alarm-Related LEDs

LED	Location	Alarm-Related Cause
ALARM LED	Attendant Console	The system alarm causes the attendant console ALARM LED to light.
ACK LED	Attendant Console	The ACK LED on the attendant console reflects the state of acknowledgement of the alarm report from INADS. However, this is only possible for S8700-based Media Servers.
RED ALM or ALARM LED	LED Panel of G700 Media Gateway	The RED ALM or ALARM LED indicates the "health" of the G700 by lighting when there are impaired functions of the Media Gateway Processor, Layer 2 Switching Processor, or VOIP engine. It lights, for example, when the power supply voltage is out of bounds, if the G700 cannot locate a Media Servers, or when the unit is overheating. It also indicates when the system is in Power-up mode, or when a Media Module is resetting.

Alarm Content

Alarms logged by Communication Manager are stored in an alarm log. All alarms include a date and time stamp that reflects the date and time of the sending device. The alarm contains:

- Device type
- Component type
- Device name
- Current ip address
- Additional information necessary for identification of alarm origination
- Severity level to indicate the priority of the alarm

Alarms originating in a specific media server, such as an S8300, have a prefix denoting that of an S8300.

QOS Alarms

An RTCP monitor using the local SNMP agent generates traps to a pre-administered trap collector. The following QoS alarms are generated:

- The **voip-callqos** alarm is generated if a single session exceeds configured QOS levels. It can generate a warning or an SNMP trap. Warnings are used for less severe problems. They can be accumulated internally within Avaya VoIP Monitoring Manager for use by the alarms defined below.
- The **voip-systemqos** alarm is generated if the number of voip-callqos warnings from all terminals exceeds a configured count over a given period (e.g. 100 alarms over 24 hours). The alarm causes a SNMP trap to be sent.
- The **voip-terminalqos** alarm is like the voip-systemqos alarm except it applies to a single terminal. If any one terminal generates a number of voip-callqos warnings that exceed a threshold then the alarm is generated.

Alarm Management

This section describes methods to determine the source of alarms that are generated when an error occurs. The alarm log is viewable and follows that defined in *Maintenance for Avaya DEFINITY® Server R, 555-233-117*. Technicians can view alarms via the Web Interface, CLI, and SAT command-line interface.

SNMP management is a function of the Avaya MultiService Network Manager application. For additional information, including information on event logs and trap logs, please refer to the *Avaya™ P333T User's Guide*.

Alarm management follows the S8700 Media Server Alarming Architecture Design; see *Maintenance for the Avaya™ S8700 Media Server with an Avaya™ SCC1 Media Gateway or an Avaya™ MCC1 Media Gateway, 555-233-143*.

Connection Strategies to a Services Organization

A services organization, such as INADS, receives alarms from the Media Server and connects to the media server for troubleshooting. There are currently two product-connect strategies: dialup modem access and Virtual Private Network (VPN) access over the Internet.

For dialup modem access:

1. Connect a USB modem, connected to a telephone line, to the USB port on the faceplate of the media server.
2. Enable the modem from the media server Web Interface. In addition, use the Setup Modem Interface under the Configure Server pages.
3. With this modem, a client PC uses the Point-to-Point Protocol (PPP) to access the media server and connect via telnet to a Linux shell.
4. Once logged into the media server, you can telnet out to media gateways, such as the G700, and other devices on the network.

NOTE:
Additionally, this modem can be used to allow the media server to call out to the INADS or other alarm receiving system to report alarms. When performing remote diagnostic tests, Services personnel should disable alarm call-outs to INADS to avoid generating unnecessary alarms. Alarm suppression is released after 30 minutes. If you are remotely logged in through the modem you prevent alarms from being sent because you are using the modem, but you do not prevent an alarm noting the absence of alarm reporting service being logged at the alarm receiving site.

The VPN alternative is achieved by the use of the Intelligent Site Manager (ISM) application. The ISM is a VPN gateway that resides on the customer's LAN and provides a means for services personnel to gain access to the customer's LAN in a secure manner over the Internet. Telnet is then used to access the media server and/or media gateways and other IP network equipment.

Alarms in Linux Media Servers

S8700 / S8500 / S8300

A Linux-based media server can be configured so that it serves as the trap collector and provides external alarm notification.

A process called the Global Maintenance Manager (GMM) runs on the media server and collects events that are logged to the Linux syslog_d process. These events consist primarily of failure notification events logged by Communication Manager and INTUITY maintenance subsystems, or of traps sent by media gateways (**G700**). For events that require external notification, one option is to call the Avaya technical service center's INADS (Initialization and Administration System). However, other possible options include sending an e-mail to specified destinations, or sending an SNMP trap to a specified network management address.

The media server has an SNMP trap manager that collects traps from:

- Uploads and downloads to media modules
- VoIP Media Modules
- VoIP engines on G700 motherboards
- G700-associated UPS systems

Media server alarms perform a similar role to Communication Manager alarms in a traditional telephony context. Media Server alarms:

- Comprise related sets of alarms, known as MOs
- Create an internal record of actual or potential problems
- Notify maintenance personnel of a problem

- Help isolate the problem's source
- Point to and facilitate local and remote resolution of a problem

> **NOTE:**
> If a user is logged into a server by an analog modem that is also the server's only alarm-reporting interface, enter **`almsuppress`** to suppress alarm reporting. Otherwise, the other server logs an occurrence of SME Event ID #1 (see SME Alarm in Media Server on page 104).

Clearing Media Server Alarms

A media server is an open standards-based CPU in the ***data***- communications context. Unlike a Communication Manager alarm, which cannot be cleared unless it is also resolved, a server alarm:

- Can be manually cleared from its log, with the **`almclear`** Linux command
- Should not be considered resolved until it is actually repaired

Displaying Media Server Alarms

In following sections, each server alarm is described, and its resolution procedure is provided. Like traditional Communication Manager MOs, the 3-column table for each server MO shows an alarm's:

1 Event ID

2 Severity

3 Definition, probable cause, and troubleshooting procedure

To help isolate a server problem, the 3rd column of these tables begins with quoted text for each event (unlike traditional Communication Manager MOs). The text consists of the verbose (-v) output of the **`almdisplay -v`** Linux command. For example, "interchange hand off failed" is the quoted text for Arbiter's Event ID #3.

If the **`almdisplay`** command returns a failure message, such as:

```
almdisplay: 4: Unable to connect to MultiVantage
```

enter the **`man almdisplay`** Linux command for command-related information.

S8300

Alarming on the S8300 Functioning as a Local Survivable Processor

The S8300 functioning as a Local Survivable Processor (LSP) logs an alarm when it becomes active. It also logs an alarm for every G700 Media Gateway that registers with it. It does NOT log alarms when IP phones register with it; rather, it logs a warning.

Communication Manager Hardware Traps

Table 27, Communication Manager Hardware Traps, on page 74 illustrates hardware traps that apply to Communication Manager.

Table 27: Communication Manager Hardware Traps

Trap	Description
Media Server HW trap	Hardware faults are analyzed by maintenance software and correlate fault conditions to determine the appropriate action. If appropriate action requires attention, a trap of critical severity is sent.
Media Server HW clear trap	Hardware faults that have created traps send a clear trap upon clearing.
Media Server with administered MG that's not registered	If a Media Server has an administered G700 but it has not registered after an appropriate amount of time, send an alarm of major severity indicating such.

NOTE:
The Avaya S8300 Media Server on a G700 Media Gateway platform has several watchdog timers. If any one of them is not verified regularly, a trap of major severity is sent. The timer associated with the S8300 is the S8300 Software watchdog, which resets the S8300 processor if its connection is not verified regularly.

Backup and Restore Traps

The S8300 uses the LAN to backup a copy of its translation data. Table 28, Backup and Restore Traps, on page 75 illustrates the backup and restore traps.

Table 28: Backup and Restore Traps

Trap	Description
successfully stored backup	A trap of informational severity is sent when backup is successful. (REPLY_ACK) The trap reads “Successful backup of S8300 translation data,” and names the backup location stored in the string “BACKUP_LOCATION.” This information also goes to the local maintenance screen, since it is very possible that a backup is being requested as a result of an on-site attempt to replace the S8300.
no backup data stored	A trap of major severity is sent as soon as a REPLY_ERROR message is returned. The trap states “Translation Data backup not available,” and names the backup location stored in the string “BACKUP_LOCATION.”

Linux Media Server MOs and Alarms

Hardware MOs

The server’s hardware MOs are described in the following sections:

- DAJ1 (Duplication Memory Board) on page 85
- RALM-SVC (Remote Alarm Service) on page 103
- USB1 (Modem Testing) Alarms on page 120
- UPS (Uninterruptible Power Supply) on page 114
- Remote Maintenance Board (RSB) Alarms on page 137

Server-related alarms

Server-related alarms and their troubleshooting procedures are described in the following tables:

- DAJ1 Alarms in S8700 Media Server on page 90
- ARB (Arbiter) on page 76
- DUP (Duplication Manager) on page 91
- ENV (Environment) on page 95
- FSY (File Synchronization) on page 100
- NIC (Network Interface Card) on page 102

- SME Alarm in S8700 Media Server on page 104
- SVC_MON (Service Monitor) on page 105
- _TM (Translation Manager) on page 114
- UPS Alarms to the Media Server on page 118
- _WD (Watchdog) Alarms on page 123
- Login Alarms on page 136
- Virtual Alarms on page 136

ARB (Arbiter)

S8700 only

The Arbiter process runs on S8700 Media Servers to:

- Decide which server is healthier and more able to be active
- Coordinate data shadowing between servers, under the Duplication Manager's control

At the physical and data-link layers, an Ethernet-based duplication link provides an interarbiter UDP communication path to:

- Enable this arbitration between the active and standby servers
- Provide the necessary status signaling for memory refreshes

Table 29, ARB Alarms in Media Server, on page 77 describes the Arbiter's alarms and their troubleshooting procedures. See DUP (Duplication Manager) on page 91 for more information.

Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
3	MIN	"Interchange hand off failed" — Standby server could not process active server's interchange request. The interchange does not occur, and the active side remains active. **1** See if the standby side is RESET, either from the: — Web interface's **Server** section, by selecting **View Summary Status** — Linux command line, by entering **`server`** **2** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **3** If the problem persists, troubleshoot the standby server. **a** See if the standby side is RESET, either from the: — Web interface's **Server** section, by selecting **View Summary Status** — Linux command line, by entering **`server`** **b** Check for application problems, either from the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`**, and restore any applications with problems. **c** Check for problems with an Ethernet interface, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** Check both sides of each failed link, and make any necessary repairs. **4** If the applications and interfaces are okay **but** the problem persists, escalate the problem.

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
7	MAJ	"Arbiter in invalid/unknown state" — Memory corruption or bad code/build **1** Verify that the server's state is "Corrupt!", either from the: — Web interface's **Server** section, by selecting **View Summary Status** — Linux command line, by entering **`server`** **2** Compare the suspected `arbiter` with the one in `/root2` — using the Linux commands: **`acpfindvers /opt/ws/arbiter`** (This command shows the arbiter's version string.) **`cksum /opt/ws/arbiter`** **`[This command runs a cyclical redundancy check (CRC) against the arbiter, and then shows both the CRC's output value and the number of bytes in the arbiter file.]`** **3** If the two `arbiter` files differ: **d** Get a fresh copy of `arbiter` from the CD. **e** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **4** If the `arbiter` file is OK **or** the problem persists, escalate the problem.
8	MIN	"Both servers thought they were active" **1** To verify this condition, either from the: — Web interface's **Server** section, select **View Summary Status** — Linux command line, enter **`server`** **2** To distinguish the cause, examine the trace logs for Interarbiter messages with timestamps shortly before to shortly after the loss of heartbeat, either from the: — Web interface, by: **a** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **b** Specifying the **Event Range** for the appropriate time frame **c** Matching the **Interarb** pattern — Linux command line, by entering **`logv -t ts`** Depending on the cause, continue with either 3 or 4:

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
8 (cont'd)	MIN	**3** A high-priority process caused the active Arbiter to hang for at least 4.5 seconds (causing an interchange). Then, the hang lifted, and each Arbiter realized that the other had assumed the active role. An automatic resolution process should leave the newly active server active, while the other server backs down to the standby role. **f** If so, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **g** If the problem recurs, escalate the problem. **4** Every Interarbiter link is down or misconfigured. **h** Check for problems with an Ethernet interface, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** Check both sides of each failed link, and make any necessary repairs. **i** If the links are OK **but** the problem persists, escalate the problem.
9	WRN	<SOH (state-of-health) string> — ***Before*** an interchange, the standby server is ***significantly*** healthier than the active server requesting the interchange. (The active server is probably unable to sustain call processing.) **Understanding ARB Event #9's String Pairs** ARB Event #9 generates pairs of SOH strings, where in each string pair, the: • 1st string represents the active • 2nd string represents the standby server's SOH just ***before*** an interchange. Since – (unless prevented by external circumstances) – Event 9 triggers a server interchange, the 1st string normally represents the less healthy server – which became the standby. So, the 1st string's data is usually more pertinent.

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation

9 (cont'd)	WRN	The following is a sample string pair generated by ARB Event #9. Within this sample, four pairs of digits in each string have special meaning, and are labeled "aa" through "dd."
		`aa bb cc dd`
		`↓↓ ØØ ØØ ØØ`
		`gmm 0700, pcd 00/00, dup 270, wd 81, actv 004`
		`gmm 0700, pcd 06/06, dup 370, wd 01, actv 014`
		• For "aa," any value other than "00" indicates a hardware problem. (For example, the value "20" is common for a power failure.)
		In the previous sample, neither server had hardware trouble.
		• For "bb" and "cc," different values within the ***same*** string indicate a problem connecting to one or more IPSI-connected PNs.
		A PN reset can cause both server's strings to reflect equally degraded health, but that event (in itself) should not trigger a server interchange.
		In the previous sample, both servers' connectivity to IPSI-connected PNs is OK. (The 1st and 2nd strings have like "00" and "06" values, respectively.)
		• For "dd," any value other than "01" indicates a failed software process. (More precisely, a certain value indicates a problem with a discrete portion of the platform's process set, including:
		— "21" for a Linux daemon (for example, "atd", "httpd", "inetd", or "xntpd")
		— "41" for a platform service (for example, "dbgserv", "prune", or "syslog")
		— "81" for reloaded Communication Manager software, as in the previous sample
		Troubleshooting ARB Event #9
		1 Compare the health of both servers, either from the:
		— Web interface's **Server** section, by selecting **View Summary Status**
		— Linux command line, by entering **`server`**
		2 Using the output from 1, check the health of each server's individual processes.
		3 Check the health of the ***active*** server's individual processes, either from the:
		— Web interface, by selecting **View Process Status**
		— Linux command line, by entering **`statapp`**
		and restore any applications with problems.

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
9 (cont'd)	WRN	**4** See if the standby side is RESET, either from the: — Web interface's **Server** section, by selecting **View Summary Status** — Linux command line, by entering **`server`** **5** Check the health of the ***standby*** server's individual processes, either from the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`**, and restore any applications with problems. **6** Check for problems with an Ethernet interface, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** Check both sides of each failed link, and make any necessary repairs. **7** If the standby's applications and interfaces are OK **but** the problem persists, escalate the problem. ***After*** the interchange, the newly active server's health should be significantly better (lower SOH value) than the standby server's. If **so**, troubleshoot the standby server: If **not**: **1** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **2** If the problem recurs, escalate the problem.
11	WRN	"Cannot create receive socket;" "cannot create transmit socket;" "cannot bind receive socket;" "cannot bind send socket" Since the Arbiter continuously attempts to create or bind the socket, the problem may resolve itself. Once resolved, the Arbiter can send and receive across every Interarbiter link (no subsequent error messages in the trace log). **1** Examine the alarm log to distinguish between a: Bind or create problem Send or receive socket problem by accessing either the: — Web interface, by: **d** Selecting **Alarms and Notification** and the appropriate alarm **e** Selecting the **View System Logs** diagnostic

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
11 (cont'd)	WRN	**f** Selecting the **Logmanager Debug** trace **g** Specifying the **Event Range** for the appropriate time frame **h** Matching the "cannot create" pattern — Linux command line, by entering **`almdisplay -v`** **2** Check for both the completeness and consistency of the servers' `hosts` and `servers.conf` files (containing IP addresses of the system's configured components), either from the: — Web interface, by selecting **Configure Server** — Linux command line, by entering: **`more /etc/hosts`** **`more /etc/opt/ecs/servers.conf`** **3** If the files are OK, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **4** If this problem affects call processing **or** if the problem persists, continue with 5 now. If **not**, continue only at the customer's convenience. **5** **Escalate** this problem for explicit guidance with steps 5j through 6 **j** Enter **`server`** to verify that the suspected server is the standby. **k** If **not**, enter **`server -if`** to force a server interchange. **l** Busy out the standby server from the Linux command line, by entering **`server -b`**. **m** Reboot the server (as the standby), either from the: — Web interface, by selecting **Shutdown This Server** — Linux command line, by entering **`shutdown -r now`** **6** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier. ***6 of 9***

Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
12	MIN	"Interchange without doing prep" — Since the Arbiter could not create a thread to request a file synchronization, some files did not get shadowed. **1** Examine the trace logs for the entry, `Can't create interchange-prep thread`, either from the: — Web interface by: **i** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **j** Specifying the **Event Range** for the appropriate time frame **k** Matching the "interchange-prep" pattern — Linux command line, by entering **`logv -t ts`** **2** Resubmit any translation changes entered during the last 15-minute file-synchronization interval. **3** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
13	MIN	"Heartbeat timeout from ACTIVE" — When the timeout occurs, this alarm is **only** logged on the standby side. After logging the alarm, the servers **should** have interchanged, so that the: • Alarm normally resides on the newly active (healthier) server • Previously active server has backed down to the standby role **As potential causes, either the:** **Alternate side is in normal shutdown (irregular, but possibly innocuous).** **1** On the standby server, look for occurrences of the **`stop`** command, either from the: — Web interface, by: **l** Selecting **View System Logs** **m** Selecting **Platform command history log** **n** Specifying the **Event Range** for the appropriate time frame **o** Matching the "Stop" pattern — Linux command line, by entering **`listhistory`** **Note:** From the system's perspective, this is normal behavior. However, in terms of potential service outage due to human error, this is quite irregular. Shutting down a server effectively downgrades a duplex-, high-, or critical-reliability system to an unsupported standard-reliability system.

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
13 (cont'd)	MIN	**2** From the Linux command line, enter **`start -a`** to restart the standby server. **3** Prevent any future misuse of the **`stop`** command. **4** Manually clear the alarm on the active server, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **Either the:** • The alternate side is hung (ARB Event 8 is **not** being generated) • Two or more Interarbiter links are down (ARB Event 8 is also being generated) Therefore, **if** the servers **interchanged** (the previously active server backed down to standby), use the following procedure: **1** Check for problems with an Ethernet interface, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** Check both sides of each failed link, and make any necessary repairs. **n** If the Ethernet interfaces are OK, see if the standby server is busied-out, either from the: — Web interface, by selecting **View Summary Status** — Linux command line, by entering **`server`** **o** If **so**, release the standby server, either from the: — Web interface, by selecting **Release Server** — Linux command line, by entering **`server -r`** If **not**, check for related alarms to troubleshoot the standby. **2** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **3** If the problem persists, escalate the problem.

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Table 29: ARB Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
13 (cont'd)	MIN	**If** the servers did **not** interchange, use the following procedure: **1** See if the standby server is busied-out, either from the: — Web interface, by selecting **View Summary Status** — Linux command line, by entering **server** **2** If **so**, release the standby server, either from the: — Web interface, by selecting **Release Server** — Linux command line, by entering `server -r` If **not**, **escalate** this problem for explicit guidance with general troubleshooting of **both** servers.

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Back to: Hardware MOs Server-related alarms

DAJ1 (Duplication Memory Board)

S8700 only

This MO supports each S8700 media server's Duplication Memory board, a NIC (network interface card) serving as the physical and data-link interface for an Ethernet-based duplication link between the servers. This link provides a ***call-status data*** path for sending:

- TCP-based communication between each server's Process Manager
- UDP-based communication between each server's Arbiter to:
  - — Enable arbitration between the active and standby servers
  - — Provide status signaling for memory refreshes

NOTE:
This call-status data is separate from the translations and Linux files shadowed between servers. (See FSY (File Synchronization) on page 100.)

(Table 33, DAJ1 Alarms in Media Server, on page 90 describes the DAJ1's alarms and their troubleshooting procedures.) [See also, ARB (Arbiter) on page 76, DUP (Duplication Manager) on page 91, and NIC (Network Interface Card) on page 102.]

Both periodic and on-demand testing is provided for this MO. The periodic test runs the Read Error Register test at 15-minute intervals. On-demand testing includes the Read Error Register and Local Loop tests.

MO's Name (in Alarm Log)	Alarm Level	Initial Linux Command to Run[1]	Full Name of MO
DAJ1	MAJOR	**testdupboard**	Server Dup Mem board
DAJ1	MINOR	**testdupboard**	Server Dup Mem board
DAJ1	WARNING	**testdupboard**	Server Dup Mem board

1 Usage: **testdupboard [-s] | [-l] | [-t *arg*] | [-?]**

no argument Performs "short" test.

-s Short test, performs read_err_reg test,

this is also the default option.

-l Performs "short" tests, and localloop test

-t *arg* Specific test to perform. Possible values for

arg are: read_err_reg | localloop.

-? Usage (this).

Alarm Log Entries

Table 30: DAJ1 Alarm Log Entries

EVENT ID#	Associated Test	Alarm Level	On/Off Board	Linux Test to Clear Value
2 (a)	Read Error Register test (EDC single-bit errors)	WARNING	ON	testdupboard
3 (b)	Read Error Register test (SDRAM multibit errors)	MAJOR	ON	testdupboard
4 (c)	DAJ1 Local Looparound test	MINOR	ON	testdupboard
5 (d)	Read Error Register test (Link Receiver CRC errors)	MINOR	ON	testdupboard
6 (e)	Read Error Register test (Link Receiver CRC errors)	MAJOR	ON	testdupboard

Notes:

a **Event ID #2** Test failed — Error counter query for single-bit EDC (bad error register) on the SDRAM is pegging. If the test detects 20 consecutive failures, the following Warning alarm is logged:

#1,ACT,DAJ1,A,2,WRN,Single-bit EDC test (bad SB err count)

b **Event ID #3** SDRAM has multiple bit errors — The DAJ1 board can also generate this event as an in-line error.

If this test detects a failure, the media server's state of health is lowered to its most critical level, and the following Major alarm is logged:

#1,ACT,DAJ1,A,3,MAJ,DAJ1 SDRAM multibit errors

c **Event ID #4** Looparound test failed — Either a mismatched address or a mismatched bit pattern could have caused a failure.

If this test detects 3 failures, the following Minor alarm is logged:

#1,ACT,DAJ1,A,4,MIN,Local Looparound test failure

d **Event ID #5** Optical Line Receiver experiencing CRC errors — If this test detects 3 failures, the following Minor alarm is logged:

#1,ACT,DAJ1,A,5,MIN,Link Receiver CRC errors

e **Event ID #6** Inability to open a communications link with the DAJ1 board. The board is out of service if this failure occurs once, and a Major alarm is logged:

#1,ACT,DAJ1,A,6,MAJ,Failed to open DAJ1 card

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order shown in. By clearing error codes associated with the first test, you may clear errors generated from other tests in the sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Read Error Register test	X	X	D
DAJ1 Board Local Loop test	X	X	D

1 D = Destructive; ND = Nondestructive

Read Error Register Test

The Read Error Register test queries three registers including the:

- Optical line receiver's CRC error register

  CRC errors indicate problems with the optical interface between the active and standby servers.

- SDRAM's single-bit error register

  Although the DAJ1can "self heal" single-bit errors in the SDRAM's error register, chronic problems can indicate a more serious problem.

- SDRAM's multiple-bit error register

  An SDRAM multiple-bit error condition indicates a problem in the DAJ1 board's memory, and cannot be recovered.

The following errors can be detected:

Table 31: TEST Read Error Register Test

Error Code	Test Result	Description / Recommendation
Open failed to MDD	ABORT	The Memory Duplication Driver (MDD) is the system driver that communicates with the DAJ1 board. If this driver cannot be opened, then the DAJ1 board's registers cannot be read. **1** This is a system type error, try again.
System Error – MDD failed to return data	ABORT	The test ran, but, for some reason the MDD could not return data. **1** This is a system type error, try again.
DAJ1 err count query, code=? ?= 1 to 7	FAIL	Test failed "DAJ1 err count query, code=?" — where "?" indicates which of the DAJ1 board's error counters had positive data. The failure code can be 1–7 and is determined by the bit vector, "0xxx". (Every "x" bit could be set, indicating that every error register had errors.) Specifically, if bit: 1 is set (0xx**1**) – Single-bit errors occurred. 2 is set (0x**1**x) – CRC errors occurred. 3 is set (0**1**xx) – Multibit errors occurred.

DAJ1 Local Loop Test

NOTE:
This is an on-demand test that only runs on the standby media server when it is busied out.

This test runs a local loop-around test on the standby media server's DAJ1 board. A 32-bit data number is written to an address and verified for correct transmission. The test reads the contents of the:

- Last data received registers
- Last address received register

and then compares the data. If the data matches, the test passes. If not, the test fails.

The following errors can be detected:

Table 32: TEST DAJ1 Local Loop Test

Error Code	Test Result	Description / Recommendation
Open failed to MDD	ABORT	The MDD is the system driver that communicates with the DAJ1 board. If this driver cannot be opened, the DAJ1 board's registers cannot be read. This is a system type error, try again.
System Error MDD failed to return data	ABORT	The test ran, but for some reason the MDD could not return data. This is a system type error, try again.
Loop-around test failed	FAIL	The last address received does not match the address that was written, or the last data received does not match the data that was written.

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DAJ1 Alarms in S8700 Media Server

S8700 only

Table 33, DAJ1 Alarms in Media Server, on page 90 describes the DAJ1 MO's alarms and their troubleshooting procedures.

Table 33: DAJ1 Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
2	WRN	"Single-bit EDC test (bad SB err cnt)" — Single-bit SDRAM error occurred 20 times. Software automatically clears the single-bit error register. This is a log-only indication of the error's occurrence. **1** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
3	MAJ	"Multibit EDC Test (bad err register)" — Catastrophic multibit SDRAM error occurred. (Usually due to a hardware problem.) **1** Enter **`testdupboard`** on the Linux command line. **2** If the test fails, **escalate** this problem for explicit guidance with 3 through 5. **3** Power-cycle the server. **4** Enter **`testdupboard`** again. **5** If the test still fails, replace the server.
4	MIN	"Local-loop failure" — On-demand local-loop test failed 3 times. (Cannot read from or write to DAJ1 buffers.) The Localloop test only runs on a busied-out standby server. **1** If the on-demand test is failing (but a running duplicated system has **no** problems), do nothing. If the running duplicated system has problems, continue with 2 **2** Enter **`testdupboard`** on the Linux command line. **3** If the test fails, **escalate** this problem for explicit guidance with 4 through 6. **4** Power-cycle the server. **5** Enter **`testdupboard`** again. **6** If the test still fails, replace the server.

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Table 33: DAJ1 Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
5	MIN	"Optical link received CRC errors" — Received multiple CRC errors across the fiber link. **1** Run **`testdupboard`** on both servers. **2** If CRC errors are occurring on both servers, it may be a: • Likely problem with the fiber link • Far less likely problem with both DAJ1 cards If **not**, the other server's DAJ1 card may be faulty. **3** If the running system has duplication-related problems, **escalate** this problem to replace the server. If **not**, ignore the alarm.

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DUP (Duplication Manager)

S8700 only

The Duplication Manager process, via coordination of the Arbiter process, runs on each S8700 Media Server to control data shadowing between them.

At the physical and data-link layers, an Ethernet-based duplication link provides a TCP communication path between each server's Duplication Manager to enable their control of data shadowing.

Table 34, DUP Alarms in Media Server, on page 92 describes the Duplication Manager's alarms and their troubleshooting procedures.

See ARB (Arbiter) on page 76 and DAJ1 (Duplication Memory Board) on page 85 for more information.

Table 34: DUP Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MAJ	"Duplication card error" — Duplication Manager determined that the duplication card is not functioning, but it cannot distinguish between a bad card, an unplugged card, or a bad fiber link. **1** Check the physical fiber connectivity at each server. **2** Verify the alarm, by accessing the trace log, either from the: • Web interface, by: **p** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **q** Specifying the **Event Range** for the appropriate time frame **r** Matching the "dup" pattern • Linux command line, by entering **`logv -t ts`** **3** Examine the trace-log query's output for one of these messages: "glbi: couldn't open Dup Card, errno=<#>. ndm exiting" "glbi: mmap failed, errno=<#>. ndm exiting" "Haven't heard from active dupmgr. Dup fiber link down." "san_check_rsp() FAILED: Dup Fiber link down." **4** See if the dup link is **both** "up" and "refreshed", either from the: • Web interface's **Server** section, by selecting **View Summary Status** • Linux command line, by entering the **`server`** command **5** If **so**, manually clear the alarm, either from the: • Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** • Linux command line, by entering **`almclear -n #id`**

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Table 34: DUP Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1 (cont'd)	MAJ	If **not** and at the customer's convenience: Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **p** Force a server interchange to make the suspected server standby, either from the Linux command line, by entering **`server -if`**. **q** Busy out the standby server from the Linux command line, by entering **`server -b`**. **r** Reboot the standby server, either from the: — Web interface, by selecting **Release Server** — Linux command line, by entering **`server -r`** **6** If the problem persists, you can try: **s** Replacing the fiber between the two servers **t** Rebooting the standby server **7** If the problem continues to persist, **escalate** for a probable server replacement.
2	MAJ	"Duplication link down" — One server's Duplication Manager cannot communicate with the other server's Duplication Manager. **1** Access the trace log, either from the: — Web interface, by: **s** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **t** Specifying the **Event Range** for the appropriate time frame **u** Matching the "dup" pattern — Linux command line, by entering **`logv -t ts`** **2** Examine the trace-log query's output for one of these messages: "mainlp: get_addrs returned ***. Could not get IP address for other server. Verify name and address in servers.conf. ndm exiting." "san_check_msg() sync_msg failed: DUPLINK DOWN."

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Table 34: DUP Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
2 (cont'd)	MAJ	**3** See if the dup link is "up", either from the: — Web interface's **Server** section, by selecting **View Summary Status** — Linux command line, by entering the **`server`** command **4** If **so**, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If **not**, check the duplication interface's Ethernet connectivity, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -d`** **5** If **pingall** passes, check the other server's applications, either from the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`**

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ENV (Environment)

S8700 / S8300

The ENV MO monitors environmental variables within the server, including temperature, voltages, and fans. Table 35, ENV Alarms in Media Server, on page 95 describes the ENV MO's alarms and their troubleshooting procedures.

Table 35: ENV Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MAJ	"Temperature reached critical low" — Motherboard's temperature reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
2	MIN	"Temperature reached warning low" — Motherboard's temperature reached a warning low. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
3	MIN	"Temperature reached warning high" — Motherboard's temperature reached a warning high. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 35: ENV Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
4 **S8300**	MAJ	"Temperature reached critical high" — Motherboard's temperature reached a critically high level. **1** Look for any obstructions blocking the server's fans. **2** Check for any fan alarms, and clear those alarms. **3** Shut down and restart the system. **4** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **5** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear**. — Linux command line, by entering **`almclear -n #id`**
6	MAJ	"+3.3 voltage reached critical low" — Motherboard's nominal +3.3 voltage reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
8	MAJ	"+3.3 voltage reached critical high" — Motherboard's nominal +3.3 voltage reached a critically high level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 35: ENV Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
10	MAJ	"+5 voltage reached critical low" — Motherboard's nominal +5 voltage reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
12	MAJ	"+5 voltage reached critical high" — Motherboard's nominal +5 voltage reached a critically high level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
14	MAJ	"+12 voltage reached critical low" — Motherboard's nominal +12 voltage reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and Clear — Linux command line, by entering **`almclear -n #id`**

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Table 35: ENV Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
16	MAJ	"+12 voltage reached critical high" — Motherboard's nominal +12 voltage reached a critically high level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
18	MAJ	"-12 voltage reached critical low" — Motherboard's nominal -12 voltage reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
20	MAJ	"-12 voltage reached critical high" — Motherboard's nominal -12 voltage reached a critically high level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 35: ENV Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
22	MAJ	"CPU core voltage reached critical low" — Motherboard's CPU core voltage reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
24	MAJ	"CPU core voltage reached critical high" — Motherboard's CPU core voltage reached a critically high level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
26	MAJ	"CPU I/O voltage reached critical low" — Motherboard's CPU I/O voltage reached a critically low level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 35: ENV Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
28	MAJ	"CPU I/O voltage reached critical high" — Motherboard's CPU I/O voltage reached a critically high level. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
29	MAJ	"All fan failure" — Every fan is running at a critically low speed. **1** See if the alarmed condition is still present, either from the: — Web interface, by selecting the **View Temperature/Voltage** diagnostic — Linux command line, by entering **`environment`** **2** If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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FSY (File Synchronization)

S8700 / S8500

The File Synchronization (FSY) process uses TCP-based communication over 100Base-T Ethernet links to provide synchronized duplication of critical data-shadowed files, including translations and important Linux files.

NOTE:
This set of files is separate from the data shadowed between each server's DAJ1 (Duplication Memory Board) on page 85.

Table 36, FSY Alarm in Media Server, on page 101 describes the FSY MO's alarms and their troubleshooting procedures.

Table 36: FSY Alarm in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MIN	"File sync failed" — File synchronization operation failed. **1** See if the filesyncd (file sync daemon) process is up, either from the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`** **2** Check the trace log for more granular information. (The file sync daemon can report failures of synchronizing one or more files.) Access the trace log, either from the: — Web interface, by: **v** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **w** Specifying the **Event Range** for the appropriate time frame **x** Matching the "file sync failed" pattern — Linux command line, by entering **`logv -t ts`** **3** (Except **S8500**) Verify that the dup link is **both** "up" and "refreshed", either from the: • Web interface's **Server** section, by selecting **View Summary Status** • Linux command line, by entering the **`server`** command (Neither side should be "off-line" nor "down".) **4** (Except **S8500**) Make sure that the Ethernet duplication link is up, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** If **not**, check each side of this failed link, and make any necessary repairs. **5** (Except **S8500**) Check the physical fiber connectivity at each server to verify that this alarm is not a consequence of other duplication-related problems. **6** If the problem persists, escalate the problem.

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NIC (Network Interface Card)

S8700 / S8500

This MO supports the NICs in each S8700 media server providing the physical and data-link interfaces for Ethernet-based links.

Table 37, NIC Alarms in Media Server, on page 102 describes NIC's alarms and their troubleshooting procedures. See DAJ1 (Duplication Memory Board) on page 85 for more information.

Table 37: NIC Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MIN	"eth0 NIC Link is Down" — Ethernet link on native NIC 0 is down. **1** Verify Ethernet connectivity, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** Check both sides of each failed link, and make any necessary repairs. **2** If the ping test fails, check the physical connections of NIC 0's Ethernet cable. If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
2	MIN	"eth1 NIC Link is Down" — Ethernet link on native NIC 1 is down. **1** Verify Ethernet connectivity, either from the: — Web interface, by selecting the **Execute Pingall** diagnostic — Linux command line, by entering **`pingall -a`** Check both sides of each failed link, and make any necessary repairs. **2** If the ping test fails, check the physical connections of NIC 0's Ethernet cable. If not, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and "Clear" — Linux command line, by entering **`almclear -n #id`**

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RALM-SVC (Remote Alarm Service)

S8700 only

For the RALM-SVC MO, maintenance software performed special periodic testing every 60 seconds.

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
RALM-SVC	MAJOR	None	Remote Alarm Service
RALM-SVC	MAJOR	None	Remote Alarm Service

Alarm Log Entries

These tests verify that the standby media server's components are operating correctly.

Table 38: RALM-SVC Alarm Log Entries

EVENT ID#	Aux Data	Associated Test	Alarm Level	On/Off Board	Linux Test to Clear Value
1 (a)		SME_ARB test	MAJOR	ON	`testdupboard`
2 (b)		Standby_PN Check test	MAJOR	ON	`testdupboard`

Notes:

a **Event ID #1** SME_ARB test failed — This test determines the other server's alarm-generation capability by querying the local server's Arbiter to report on the other server's Remote Alarm Service functionality. Both media servers must have their own alarm-generation utilities. If the test fails 3 consecutive times, the following Major alarm is logged:

#1,ACT,SME,A,1,MAJ,Far-end alarm service is down

b **Event ID #2** Standby_PN_Check test failed — This periodic test:

1. Queries the standby media server about its PNs' state of health
2. Compares the acquired information to an administered value

A failure indicates that a mismatch occurred and that the standby media server is out of sync. If this test fails 2 consecutive times, the following Major alarm is logged:

#1,ACT,SME,A,2,MAJ,Standby Port-Network check failed

System Technician-Demanded Tests: Descriptions and Error Codes

This MO provides no on-demand tests for system technicians.

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SME Alarm in S8700 Media Server

Table 39, SME Alarm in Media Server, on page 104 describes the SME alarm (for RALM-SVC (Remote Alarm Service) and its troubleshooting procedures.

Table 39: SME Alarm in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MAJ	"Far-end alarm service is down" — No remote alarm service is available since the other server is unable to report alarms — due to a failure of either the GMM or administered reporting mechanisms (SNMP and/or modem). **1** Look for any GMM failures on the **other** server, either using the: — Web interface, by selecting **Diagnostics > View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** If a GMM failure was found: **u** See if the GMM application is up, either from the: **—** Web interface, by selecting **View Process Status** **—** Linux command line, by entering **`statapp`** **v** If so, continue with 3. If **not**, try to restart this application by entering **`start -s GMM`** on the Linux command line. **w** If the GMM application successfully restarts, continue with 4. If **not**, **escalate** the problem to the next higher tier. **3** If a GMM failure was **not** found, see if alarm reporting failed by looking in the trace log for a string that includes "snd2Inads", either from the: — Web interface, by: **y** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **z** Specifying the "Event Range" for the appropriate time frame **aa** Matching the "snd2Inads" pattern — Linux command line, by entering **`logv -t ts`** **4** Test the administered reporting mechanisms, by entering **`testinads`** on the Linux command line. **5** Once the alarm is resolved, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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SVC_MON (Service Monitor)

S8700 / S8500

SVC_MON is a media server process, started by Watchdog, to monitor Linux services and daemons. It also starts up threads to communicate with a hardware-sanity device.

Table 40, SVC_MON Alarms in Media Server, on page 106 describes the SVC_MON MO's alarms and their troubleshooting procedures.

[For information about Watchdog, see also Watchdog and applications on page 124 in *Maintenance Procedures (555-245-103)*. For alarm-related information about Watchdog, see _WD (Watchdog) Alarms on page 123.

Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MIN	"service atd could not be restarted" — The Linux at daemon is down. Scheduled services such as session cleanup or daily filesync will not work. **1** Enter **`service atd restart`** to restart the at daemon. **2** If the daemon restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2x through 3 **x** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. **CAUTION:** Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **y** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step d. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **z** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **aa** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier.

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Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
2	MIN	"service crond could not be restarted" — The Linux cron daemon is down. Periodic services such as session cleanup or daily filesync will not work. **1** Enter **`service cron restart`** to restart the cron daemon. **2** If the daemon restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2ab through 3 **ab** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **ac** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step d. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **ad** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **ae** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier. ***2 of 8***

Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
3	MIN	"service inet could not be restarted" — The Linux internet server daemon is down. Networking services will not work. **1** Enter **`service inet restart`** to restart the inet daemon. **2** If the daemon restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If **not**, **escalate** this problem for explicit guidance with steps 2af through 3 **af** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. **ag** If this problem affects call processing, continue with the following steps now. If **not**, continue only at the customer's convenience – since the following commands cause a brief service outage. The following commands cause a brief service outage. **ah** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step e. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **ai** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **aj** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier.

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Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
4	MIN	"service syslog could not be restarted" — Linux "syslog" service is down. Event logging to syslog and alarm generation will fail. **1** Enter **`service syslog restart`** to restart the syslog service. **2** If the service restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2ak through 3 **ak** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **al** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step d. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **am** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **an** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier. ***4 of 8***

Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
5	MIN	"service xntpd could not be restarted" — The Linux network time protocol daemon is down. The server's clock and recently logged time stamps may be inaccurate. **1** Enter **`service xntpd restart`** to restart the xntpd daemon. **2** If the daemon restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2ao through 3 **ao** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. **ap** If this problem affects call processing, continue with the following steps now. If **not**, continue only at the customer's convenience – since the following commands cause a brief service outage. The following commands cause a brief service outage. **aq** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step e. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **ar** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **as** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier.

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Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
6	MIN	"service dbgserv could not be restarted" — Debug server is down, and Gemini debugger may not work. Although losing this service does not affect operations, the debugging of a running system is prevented. **1** Enter **`service dbgserv restart`** to restart the dbgserv service. **2** If the service restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2at through 3 **at** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **au** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step d. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **av** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **aw** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier. ***6 of 8***

Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
7	MIN	"service prune could not be restarted" — The prune service is not running. The hard disk's partition usage is not being monitored or cleaned. **1** Enter **`service prune restart`** to restart the prune service. **2** If the service restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2ax through 3 **ax** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. **ay** If this problem affects call processing, continue with the following steps now. If **not**, continue only at the customer's convenience – since the following commands cause a brief service outage. The following commands cause a brief service outage. **az** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step e. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **ba** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **bb** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier. ***7 of 8***

Table 40: SVC_MON Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
8	MIN	"service httpd could not be restarted" — The hypertext transfer protocol daemon is down. The Web interface will not work. **1** Enter **`service httpd restart`** to restart the http daemon. **2** If the daemon restarts, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** If not, **escalate** this problem for explicit guidance with steps 2bc through 3 **bc** Enter **`grep svc_mon /var/log/messages`** to investigate why the daemon failed. Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **bd** If the **`grep`** command's output does not help: • **S8700**: enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. • **S8500**: Proceed to Step d. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **be** **S8700**: Reboot the standby server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **bf** **S8500**: Reboot the server, either from the: • Web interface, by selecting **Shutdown This Server** • Linux command line, by entering **`shutdown -r now`** **3** If rebooting the standby does not help **or** if the problem recurs, escalate the problem to the next higher tier.

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Back to: Hardware MOs Server-related alarms

_TM (Translation Manager)

S8700 / S8500 / S8300

The _TM MO is an S8700 Media Server that monitors the server's ability to read Communication Manager translations. Table 41, _TM Alarm in Media Server, on page 114 describes the _TM MO's alarm and its troubleshooting procedures.

Table 41: _TM Alarm in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MAJ	"Cannot read translations" — Server could not read translations. Usually, indicates a failure loading translations, but can also infrequently occur on a running system. **S8700**: The servers spontaneously interchange. **S8500**: The server reboots. **1** Check the integrity of the translation files xln1 and xln2 in /etc/opt/defty, and verify that they are of the same non-zero length. **2** Enter the Linux command **`cksum`** to verify the checksum of the files. **3** **S8700**: Copy the translation files from the backup or the other server. **4** **S8500**: Copy the translation files from the backup. **5** If 1 to 3 do not help, load the system with null translations. **6** If the system comes up, this is probably a translation problem. If **not**, escalate the problem. **7** Once resolved, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

Back to: Hardware MOs Server-related alarms

UPS (Uninterruptible Power Supply)

S8700 / S8500 / S8300

The UPS MO supports the UPS device for each media server. This MO's maintenance software reacts to UPS-generated in-line errors via SNMP traps.

NOTE:
This MO provides no periodic or on-demand tests.

UPS Traps to Media Server

Table 42, Enterprise-Specific UPS Traps to Server, on page 115 contains the various UPS-generated SNMP traps to the media server.

Table 42: Enterprise-Specific UPS Traps to Server

SNMP Trap from UPS	Event ID	Definition of Trap
Trap (1)	#6 (1–8)	Alarm string = #1, ACT, UPS, A, 6, MAJ, power failure: Shutting down in 6 minutes. If the Event ID is 6, the UPS battery's power is in a critically low condition, with an estimated 6 minutes of remaining holdover. • A warning is written to every logged-in user of the server. • When 6 minutes elapse, the server begins shutting down. (For troubleshooting procedures, see Events #1–8 on page - 118.)
Trap (1)	#7 (1–8)	Alarm string = #1, ACT, UPS, A, 7, MAJ, power failure: Shutting down in 7 minutes. The UPS battery's power is in a critically low condition, with an estimated 7 minutes of remaining holdover. • A warning is written to every logged-in user of the server. • When 7 minutes elapse, the server begins shutting down. (For troubleshooting procedures, see Events #1–8 on page - 118.)
Trap (1)	#8 (1–8)	Alarm string = #1, ACT, UPS, A, 8, MAJ, power failure: Shutting down in 8 minutes. The UPS battery's power is in a critically low condition, with an estimated 8 minutes of remaining holdover. • A warning is written to every logged-in user of the server. • When 8 minutes elapse, the server begins shutting down. (For troubleshooting procedures, see Events #1–8 on page - 118.)
Trap (3) upsAlarmShutdownPending	#12	Alarm string = #1, ACT, UPS, A, 12, WRN, Miscellaneous trap, e.g., bad battery. (For troubleshooting procedures, see Event #12 on page - 118.)

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Table 42: Enterprise-Specific UPS Traps to Server

SNMP Trap from UPS	Event ID	Definition of Trap
Trap (3)[1] upsAlarmShutdownImminent	#13	Alarm string = #1,ACT, UPS, A, 13, MAJ, Miscellaneous trap, e.g., bad battery. (For troubleshooting procedures, see Event #13 on page - 118.)
Trap (3)[1] upsAlarmDepletedBattery	#14	Alarm string = #1,ACT,UPS,A,14,MAJ,Miscellaneous trap, e.g., bad battery. (For troubleshooting procedures, see Event #14 on page - 118.)
Trap (3)[1] upsAlarmBatteryBad	#15	Alarm string = #1,ACT,UPS,A,15,MIN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #15 on page - 118.)
Trap (3) upsAlarmInputBad	#16	Alarm string = #1,ACT,UPS,A,16,MIN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #16 on page - 118.)
Trap (3) upsAlarmTempBad	#17	Alarm string = #1,ACT,UPS,A,17,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #17 on page - 118.)
Trap (3) upsAlarmCommunicationsLost	#18	Alarm string = #1,ACT,UPS,A,18,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #18 on page - 119.)
Trap (3) upsAlarmBypassBad	#19	Alarm string = #1,ACT,UPS,A,19,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #19 on page - 119.)
Trap (3) upsAlarmLowBattery	#20	Alarm string = #1,ACT,UPS,A,20,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #20 on page - 119.)
Trap (3) upsAlarmUpsOutputOff	#21	Alarm string = #1,ACT,UPS,A,21,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #21 on page - 119.)
Trap (3) upsAlarmOutputBad	#22	Alarm string = #1,ACT,UPS,A,22,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #22 on page - 119.)

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Table 42: Enterprise-Specific UPS Traps to Server

SNMP Trap from UPS	Event ID	Definition of Trap
Trap (3) upsAlarmOutputOverload	#23	Alarm string = #1,ACT,UPS,A,23,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #23 on page - 119.)
Trap (3) upsAlarmChargerFailed	#24	Alarm string = #1,ACT,UPS,A,24,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #24 on page - 119.)
Trap (3) – upsAlarmFanFailure	#25	Alarm string = #1,ACT,UPS,A,25,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #25 on page - 120.)
Trap (3) – upsAlarmFuseFailure	#26	Alarm string = #1,ACT,UPS,A,26,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #26 on page - 120.)
Trap (3) – upsAlarmGeneralFault	#27	#1,ACT,UPS,A,27,WRN,Miscellaneous trap, e.g., bad battery (For troubleshooting procedures, see Event #27 on page - 120.)

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1. These events will degrade the server's state of health.

System Technician-Demanded Tests: Descriptions and Error Codes

This MO provides no on-demand tests for system technicians.

Back to: Hardware MOs Server-related alarms

UPS Alarms to the Media Server

S8700 / **S8500** / **S8300**

Table 43, UPS Alarms to the Media Server, on page 118 describes the server's UPS-related alarms and their troubleshooting procedures.

Table 43: UPS Alarms to the Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1–8	MAJ	"upsEstimatedMinutesRemaining" — UPS does not have an AC-power source. **1** Restore AC power to the UPS.
12	MAJ	"upsAlarmShutdownPending" — A shutdown-after-delay countdown is underway (i.e., the UPS has been commanded off). **1** Stop countdown timer. (Can be done via SNMP messages.)
13	MAJ	"upsAlarmShutdownImminent" — The UPS will turn off power to the load in < 5 seconds. **1** Restore AC power to the UPS.
14	MAJ	"upsAlarmDepletedBattery" — If primary power is lost, the UPS could not sustain the current load. **1** Charge or replace the batteries in the UPS, according to procedures in its *Site Preparation, Installation, and Operator's Manual, 167-405-035*.
15	MAJ	"upsAlarmBatteryBad" — One or more batteries needs to be replaced. **1** Replace any defective batteries in the UPS, according to procedures in its *Site Preparation, Installation, and Operator's Manual, 167-405-035*.
16	MIN	"upsAlarmInputBad" — An input condition is out of tolerance. **1** Provide appropriate AC power to the UPS.
17	MIN	"upsAlarmTempBad" — The internal temperature of a UPS is out of tolerance. (On the UPS, the "over temperature" alarm indicator flashes, and the UPS changes to Bypass mode for cooling. Either: **1** Look for and remove any obstructions to the UPS's fans. **2** Wait at least 5 minutes, and restart the UPS. **3** Check for and resolve any fan alarms (Event ID 25) against the UPS. **4** Either: • Change (increase or decrease) the environment's temperature. • Change the alarming thresholds.

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Table 43: UPS Alarms to the Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
18	MIN	"upsAlarmCommunicationsLost" — The SNMP agent and the UPS are having communications problems. (A UPS diagnosis may be required.) **1** Behind the UPS in its upper left-hand corner, verify that an SNMP card (with an RJ45 connector) resides in the UPS — instead of a serial card with DB9 and DB25 connectors. **2** Verify that the server is physically connected to the UPS via the RJ45 connector. **3** Verify that the SNMP card is properly administered according to the procedures in its users guide, provided by the vendor. **4** If necessary, replace the SNMP card in the UPS. **5** If the problem persists, replace the UPS, and diagnose it later.
19	WRN	"upsAlarmBypassBad" — The "source" power to the UPS, which (during a UPS overload or failure) also serves as "bypass" power to the load, is out of tolerance — incorrect voltage by > ±12% or frequency > ±3%. This on-line UPS normally regenerates its source power into clean AC power for the load. However, the source power's quality is currently unacceptable as bypass power to the load). **1** Verify that the UPS expects the correct "nominal input voltage" from its power source. **2** If **so**, restore acceptable AC power to the UPS. If **not**, reconfigure the UPS to expect the correct voltage, according to procedures in its *Site Preparation, Installation, and Operator's Manual, 167-405-035*.
20	WRN	"upsAlarmLowBattery" — The battery's remaining run time ≤ specified threshold. **1** Restore AC power to the UPS.
21	WRN	"upsAlarmUpsOutputOff" — As requested, UPS has shut down output power. The UPS is in Standby mode. **1** Turn on output power. (Can be done via SNMP messages.)
22	WRN	"upsAlarmOutputBad" — A receptacle's output is out of tolerance. (A UPS diagnosis is required.) **1** Replace the UPS, and diagnose it later.
23	WRN	"upsAlarmOutputOverload" — The load on the UPS exceeds its output capacity. The UPS enters Bypass mode. **1** Reduce the load on the UPS. **2** Verify that the UPS returns to Normal mode.
24	WRN	"upsAlarmChargerFailed" — The UPS battery charger has failed. (A UPS diagnosis is required.) **1** Replace the UPS, and diagnose it later.

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Table 43: UPS Alarms to the Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
25	WRN	"upsAlarmFanFailure" — One or more UPS fans have failed. Unless lightly loaded, the UPS enters Bypass mode. **1** Replace the UPS, and diagnose it later.
26	WRN	"upsAlarmFuseFailure" — One or more UPS fuses have failed. **1** Replace the UPS, and diagnose it later.
27	WRN	"upsAlarmGeneralFault" — A general fault occurred in the UPS. (A UPS diagnosis is required.) **1** Replace the UPS, and diagnose it later.

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This MO provides periodic and on-demand testing. The periodic test runs the "handshake" test every 15 minutes. The on-demand tests include the "handshake", "off-hook", and "reset_usb" tests.

Hardware MOs ***Server-related alarms***

USB1 (Modem Testing) Alarms

S8700 / S8500

This MO provides periodic and on-demand testing. The periodic test runs the "handshake" test every 15 minutes. The on-demand tests include the "handshake", "off-hook", and "reset_usb" tests.

MO's Name (in Alarm Log)	Alarm Level	Initial Linux Command to Run	Full Name of MO
USB1	MAJOR	**testmodem**	USB Port Modem Testing
USB1	MINOR	**testmodem**	USB Port Modem Testing
USB1	WARNING	**testmodem**	USB Port Modem Testing

Usage: **testmodem [-s] | [-l] | [-t *arg*] | [-?]**	
no argument	Performs "short" test.
`-s`	Short test, performs handshake and off-hook tests this is also the default option.
`-l`	Performs "long" tests.
`-t` *arg*	Specific test to perform. Possible values for arg are: reset_usb | handshake | off-hook |
`-?`	Usage (this).

Alarm Log Entries

Table 44: USB1 Alarm Log Entries

EVENT ID#	Aux Data	Associated Test	Alarm Level	On/Off Board	Linux Test to Clear Value
1 (a)		Handshake test	MINOR	ON	`testdupboard`
2 (b)		Modem Off-Hook test	MAJOR	ON	`testdupboard`

Notes:

a **Event ID #1** Handshake Test failed — With 3 consecutive failures of either the periodic or on-demand test, the following Minor alarm is logged:

```
#1,ACT,USB1,A,1,MIN,USB Modem handshake test failed
```

b **Event ID #2** Modem Off-Hook test failed — With 3 consecutive failures of this test, the following Major alarm is logged:

```
#1,ACT,USB1,A,2,MAJ,USB Modem Off-Hook test failed
```

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. For example, by clearing error codes associated with the Handshake test, you may also clear errors generated by other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Handshake test	X	X	D
Off-Hook test	X	X	D
Reset USB test	X	X	D

1 D = Destructive; ND = Nondestructive

Handshake Test

This test is **destructive**.

This test verifies that modem's hardware is attached and that the modem can "handshake" with the USB port. The test:

1 Tries to open the device

2 Sends a handshake string (ATZ) to the modem

The modem should return an "OK" string.

The following errors can be detected:

Table 45: TEST Handshake Test

Error Code	Test Result	Description / Recommendation
Modem in use, try again later	ABORT	Another application is currently using the modem. Try again later.
Could not open USB port	ABORT	System error: An attempt to open the USB device failed. **1** Retry the test in about 5 minutes. **2** If the test still fails, escalate the problem.
Read error, could not run test	ABORT	After the ATZ is sent, a read of the USB device is done. If the read fails, a probable system error aborted the test. **1** Retry the test in about 5 minutes. **2** If the test still fails, escalate the problem.
Modem Handshake test failed	FAIL	The modem did not return an “OK” string within a 15-second interval.

Off-Hook Test

This test is **destructive**.

This test runs an off-hook test for the modem attached to the USB port on the server. The test sends an ATH1 string to check that a line is connected to the modem. The following errors can be detected:

Table 46: TEST Off-Hook Test

Error Code	Test Result	Description / Recommendation
Modem in use, try again later	ABORT	Some other application is currently using the modem. Try again later.
Could not open USB port	ABORT	System error: An attempt to open the USB device failed. Try again later
Read error, could not run test	ABORT	After the ATZ is sent, a read of the USB device is done. If the read fails, a probable system error aborted the test. Try again.
Modem Off-Hook test failed	FAIL	Modem Off-Hook test failed: The modem did not return an “OK” string within a 15-second interval. This indicates that dial tone was not detected in the allotted time.

Reset USB Test

This test is **destructive**.

This test causes the modem to be reset, even if the modem is in use. Although no failures are produced by this test, the following error can be detected:

Table 47: TEST Reset USB

Error Code	Test Result	Description / Recommendation
Could not open USB port	ABORT	System error: An attempt to open the USB device failed. Try again later.

Back to: Hardware MOs Server-related alarms

_WD (Watchdog) Alarms

S8700 / S8500 / S8300

The Watchdog MO is a media server process that:

- Creates other Communication Manager processes
- Monitors their sanity
- Can recover their failures

These applications come up and start heartbeats to the Watchdog. For more information about Watchdog, see Watchdog and applications on page 124 in *Maintenance Procedures (555-245-103)*. Table 48, _WD Alarms in Media Server, on page 124 describes the _WD MO's alarms and their troubleshooting procedures.

Watchdog also starts up a script to monitor Linux services and daemons, and threads to communicate with a hardware-sanity device. For alarm-related information about these services, daemons, and threads, see SVC_MON (Service Monitor) on page 105.

Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
4 **S8300**	MAJ	"Application <name> (pid) TOTALLY FAILED" — An application is present, but not launching. The application could not start the maximum allowed number of times. (This alarm usually occurs with Event ID #20.) **1** To verify the alarm, look for the application's name or process ID (PID)," either using the: — Web interface, by selecting **`Diagnostics`** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** If the application is down, enter **`start -s application`** to start the application. **3** If the application comes up, continue with 7. If **not**, check the trace log to further investigate why the application fails, either from the: — Web interface by: **ab** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **ac** Specifying the **Event Range** for the appropriate time frame **ad** Matching the application's PID as the pattern — Linux command line, by entering **`logv -t ts`** Look for a related core-dump file in `/var/crash`, and **escalate** for an analysis of this file. **4** Verify that the executable file named in the log exists and is executable. To locate the application's executable file, enter the Linux command: **`ls -l /opt/ecs/sbin/`*`appl`*** If the executable is present, Linux returns a symbolic link to its location.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
4 (cont'd)	MAJ	**5** If **so** (**less** common): **bg** Enter **`ls -l`** on the symbolic link's address. **bh** Verify that the executable has "execution" permissions. **bi** If not, enter **`chmod +x`** to enable execution of the application. If **not** — Linux has returned a "null link" (**more** common): — Acquire the executable from the CD. **6** Enter **`start -s application`** to start the application. **7** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **8** If the problem recurs, escalate the problem.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
5	MIN	"WARNING: timeout waiting for reqsvr to initialize" — During each server's boot process, the server's Watchd process waits up to 2 minutes for its "reqsvr" (request server) thread to initialize. If the 2-minute waiting interval elapses, this server logs this alarm, and its boot process hangs. (Meanwhile, if the other server is already booted or subsequently boots, it assumes the active role.) In that (when this alarm occurs) a server hangs during its booting process, this alarm's external symptoms resemble those of two other _WD alarms, #13 (Except S8500) and #14 (Except S8500). Therefore, carefully discriminate between these three events. **1** To inspect the symptoms of this problem, verify that the: **bj** Linux OS and the Web interface are **up** (including the commands: **`telnet`**, **`statapp`**, **`server`**, **`logv`**, **`cat`**, **`grep`**, **`tail`**, **`vi`**, etc.) **bk** Watchdog application is **partially up**, but **no** other Communication Manager software is up **bl** The **`almdisplay`** command displays **no** alarms. Instead, the command returns the message: "`almdisplay: 4: Unable to connect to MultiVantage`" Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **2** **Escalate** this problem for explicit guidance with the following steps. **3** Enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **4** Reboot the standby server, either from the: — Web interface, by selecting **Shutdown This Server** — Linux command line, by entering **`shutdown -r now`** **5** Once the standby server has booted, verify that Event ID #5 was logged, either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **6** If rebooting the server does not help **or** if the problem recurs, escalate the problem to the next higher tier.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
6 **S8300**	MAJ	"Application <name> (pid) not started, config parm errors" — Watchdog cannot read its configuration file, `/etc/opt/ecs/watchd.conf`. **1** To verify the alarm, look for the application's name or process ID (PID), either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** Get a fresh copy of `watchd.conf` from the CD. **3** Enter **`start -s application`** to start the application. **4** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**
7 **S8300**	MAJ	"Application <name> not started, parm file errors" — Since an application's specified location in `watchd.conf` is incorrect, Watchdog cannot start the application. **1** To verify the alarm, look for the application's or process ID (PID), either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** Verify that the executable file named in the log exists and is executable. To locate the application's executable file, enter the Linux command: **`ls -l /opt/ecs/sbin/`*`appl`*** If the executable is present, Linux returns a symbolic link to its location. **3** If **so** (**less** common): **bm** Enter **`ls -l`** on the symbolic link's address. **bn** Verify that the executable has "execution" permissions. **bo** If not, enter **`chmod +x`** to enable execution of the application. If **not** — Linux has returned a "null link" (**more** common): — Acquire the executable from the CD. **4** Verify that the string in `watchd.conf` is correct. **5** Enter **`start -s application`** to start the application. **6** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
13 (Except **S8500**)	MIN	"ERROR: could not dup socket fd in reqsvr.c, heartbeat thread not created, errno=<x>" — As either a: • Booting application initiates • Restarting application **re**initiates heartbeating with Watchdog (see Event ID #5), the "reqsvr" (request server) thread tries to create a duplicate socket for the hearbeating thread. This alarm indicates that reqsvr could not create the socket. (Meanwhile, if the other server is already started or subsequently starts, it assumes the active role.) In that (when this alarm occurs) a server hangs, this alarm's external symptoms resemble those of two other _WD alarms, #5 and #14 (Except S8500). Therefore, carefully discriminate between these three events. **1** To inspect the symptoms of this problem, verify that the: **bp** Linux OS and the Web interface are **up** (including the commands: **`telnet`**, **`statapp`**, **`server`**, **`logv`**, **`cat`**, **`grep`**, **`tail`**, **`vi`**, etc.) **bq** Watchdog application is **partially up**, and **some** other Communication Manager processes may be up, either using the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`** **br** If the GMM process is up, the **`almdisplay -v`** command shows Event #13's message string. If **not**, the Watchdog log shows the message string, either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **2** **Escalate** this problem for explicit guidance with the following steps. **3** Enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **4** Reboot the standby server, either from the: — Web interface, by selecting **Shutdown This Server** — Linux command line, by entering **`shutdown -r now`** **5** If rebooting the server does not help **or** if the problem recurs, escalate the problem to the next higher tier.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
14 (Except **S8500**)	MIN	"ERROR in req2svr.p trying to create heartbeat thread, errno=<x>" — After the "reqsvr" (request server) creates a duplicate socket (see Event ID #13 (Except S8500)), it tries to create a heartbeating thread. This alarm indicates that reqsvr could not create the thread. (Meanwhile, if the other server is already started or subsequently starts, it assumes the active role.) In that (when this alarm occurs) a server hangs, this alarm's external symptoms resemble those of two other _WD alarms, #5 and #13 (Except S8500). Therefore, carefully discriminate between these three events. **1** To inspect the symptoms of this problem, verify that the: **bs** Linux OS and the Web interface are **up** (including the commands: **`telnet`**, **`statapp`**, **`server`**, **`logv`**, **`cat`**, **`grep`**, **`tail`**, **`vi`**, etc.) **bt** Watchdog application is **partially up**, but **all** other Communication Manager processes are up, either using the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`** **bu** The **`almdisplay -v`** command shows Event #14's message string Since the following commands cause a brief service outage, they should only be executed at the customer's convenience. **2** **Escalate** this problem for explicit guidance with the following steps. **3** Enter **`server`** to verify that the suspected server is the standby. If necessary **and** at the customer's convenience, enter **`server -if`** to force a server interchange. **4** Reboot the standby server, either from the: — Web interface, by selecting **Shutdown This Server** **5** If rebooting the server does not help **or** if the problem recurs, escalate the problem to the next higher tier. ***6 of 12***

Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
15 **S8300**	MAJ	"Detected a rolling reboot" — Watchdog has detected "x" number of Linux reboots within "y" minutes (where x and y are configurable in `/etc/opt/ecs/watchd.conf`). Rolling reboots have a wide variety of possible causes. **1** To verify the alarm, look for the message, "WARNING: Rolling reboot detected!!," either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** **Escalate** this problem for explicit guidance with the following steps. **3** Paying special attention to Communication Manager errors, continue examining the Watchdog log (from 1), and try to determine which application failed. **4** Verify that every executable file listed in `watchd.conf` exists and is executable. Rolling reboots are often caused by executables in unexpected locations. **5** If the files and their locations are OK, investigate the trace log to isolate the cause, either from the: — Web interface by: **ae** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **af** Specifying the **Event Range** for the appropriate time frame **ag** Matching the "rolling reboot" pattern — Linux command line, by entering **`logv -t ts`**
18 **S8300**	WRN	"Application <name> restarted. Retry <retry count>, New Pid: <pid>" — An application has failed, and Watchdog successfully restarted it. **1** To verify the alarm, look for the application's name or process ID (pid), either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** **No** resolution. Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
19 **S8300**	MIN	"Application failed unintentionally" — Watchdog is bringing the system down because an application failed to start correctly. The application may have failed to start either because: • The file did not exist (coincident with Event ID #7). • Required application parameters were missing or invalid in `watchd.conf`. **1** To verify the alarm, look for the message, "Application num <#> (<application path>) not started. Watchdog exiting NOW," either using the: — Web interface, by selecting **Diagnostics > View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** Verify that the file named in the log exists and is executable. **3** Verify that the string in `watchd.conf` is correct. **4** If 2 and 3 are OK, investigate the trace log to see why the application fails, either from the: — Web interface by: **ah** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **ai** Specifying the **Event Range** for the appropriate time frame **aj** Matching the application's number as the pattern — Linux command line, by entering **`logv -t ts`** **5** Once resolved, manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`**

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
20 **S8300**	MAJ	"Application <name> (pid) TOTALLY FAILED" — Application failed the maximum allowed number of times. (This alarm usually occurs with Event ID #4.) **1** To verify the alarm, look for the application's name or process ID (PID), either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** See if the application is up, either from the: — Web interface, by selecting **View Process Status** — Linux command line, by entering **`statapp`** **3** If the application is down, enter **`start -s application`** to start the application. **4** If the application comes up, continue with 8. If **not**, check the trace log to further investigate why the application fails, either from the: — Web interface by: **ak** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **al** Specifying the **Event Range** for the appropriate time frame **am** Matching the application's PID as the pattern — Linux command line, by entering **`logv -t ts`** **5** To locate the application's executable file, enter the Linux command: **`ls -l /opt/ecs/sbin/`*`appl`*** If the executable is present, Linux returns a symbolic link to its location. **6** If **so** (**less** common): **bv** Enter **`ls -l`** on the symbolic link's address. **bw** Verify that the executable has "execution" permissions. **bx** If not, enter **`chmod +x`** to enable execution of the application. If **not** — Linux has returned a "null link" (**more** common): — Acquire the executable from the CD.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
20 (cont'd)	MAJ	**7** Enter **`start -s application`** to start the application. **8** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **9** If the problem recurs, escalate the problem.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
22 **S8300**	WRN	"Application <name> (<pid>) terminated" — Watchdog successfully shut down the named application, and (if appropriate) watchdog will try to restart it. **1** To verify the alarm, look for the application's name or process ID (PID), either using the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** On the standby server, look for occurrences of the **`stop`** command, either from the: — Web interface, by: **an** Selecting **View System Logs** **ao** Selecting **Platform command history log** **ap** Specifying the **Event Range** for the appropriate time frame **aq** Matching the "Stop" pattern — Linux command line, by entering **`listhistory`** **3** If a **`stop`** command was inappropriately executed, prevent any future misuse of the **`stop`** command. **Note:** From the system's perspective, this is normal behavior. However, in terms of potential service outage due to human error, this is quite irregular. (Shutting down a server effectively downgrades a duplex-, high- or critical-reliability system to an unsupported standard-reliability system.) **4** If **`listhistory`** shows no **`stop`** commands, then Watchdog responded to abnormal internal processes by shutting down the application. Check the trace log for information about this application, either from the: — Web interface, by: **ar** Selecting the **View System Logs** diagnostic and **Logmanager Debug** trace **as** Specifying the **Event Range** for the appropriate time frame **at** Matching the application's PID as the pattern — Linux command line, by entering **`logv -t ts`** **5** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **6** Watch to see if the alarm recurs. If so, escalate the problem.

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Table 48: _WD Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
23 **S8300**	MAJ	"Watchd high-monitor thread is rebooting the system" — The: **1** Lo-monitor thread is missing heartbeats (can't get CPU time). **2** Hi-monitor thread has tried 3 times to recover the system by killing any infinitely looping processes. If after 3 CPU-occupancy profiles and recoveries, the lo-monitor thread is still not heartbeating, then Watchd reboots the server. **1** To verify the alarm, look for messages: Containing the CPU profiling results and attempted recoveries Stating that Watchd is rebooting the server using either the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** A resolution is probably unnecessary. The server has usually rebooted by the time a technician can analyze the system. (A reboot clears the alarm and normally fixes problems with unresponsive software.) **2** Watch to see if the alarm recurs. If so, escalate the problem.
24 **S8300**	MAJ	"Watchd's high-monitor thread is stopping tickling of hw" — Event ID #23's call to reboot the server was unsuccessfully invoked. (A Linux kernel's semaphore is possibly stuck.) After this happens, Watchd stops tickling the HW sanity timer so that the HW sanity watchdog executes a hard reboot of the processor. **1** To verify that the alarm occurred, look for messages about: Stopping the tickling of the HW sanity timer CPU occupancy profiling using either the: — Web interface, by selecting **Diagnostics** > **View System Logs** and **Watchdog Logs** — Linux command line, by entering **`logv -w`** **2** If the HW sanity watchdog successfully executed a hard reboot, the alarm was cleared. (This reboot normally fixes problems due to unresponsive software.) If **not**, power cycle the server to release it from this condition and to clear the alarm. **3** Watch to see if the alarm recurs. If **so**, escalate the problem.

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Login Alarms

S8300

Table 49, login Alarms in Media Server, on page 136 describes media server login alarms and their troubleshooting procedures.

Table 49: login Alarms in Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	WRN	**1** On the Web Interface, choose **View Current Alarms**. **2** Notify Customer.
2	WRN	**1** On the Web Interface, choose **View Current Alarms**. **2** Notify Customer.
3	MIN	Security violation. **1** On the Web Interface, choose **View Current Alarms**. **2** Notify Customer.
4	MIN	Security violation. **1** On the Web Interface, choose **View Current Alarms**. **2** Notify Customer.
5	MAJ	Security violation. **1** On the Web Interface, choose **View Current Alarms**. **2** Notify Customer.

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Virtual Alarms

S8300 only

The Virtual Announcement Media Module faults are managed as server alarms. In the S8300 Media Server, the Virtual Analog Angel (VAA) represents a messaging board. The VAA is a virtual board on the G700. When the G700 reboots, the VAA senses that it has lost connectivity with the G700, and triggers its "removal and re-insertion". The removal of the VAA causes the AUDIX ports to go out-of-service and to return back in service when the re-insertion is complete. An alarm of MAJOR severity is generated,

indicating loss of connectivity with the G700, which must be cleared manually. Table 50, Virtual Alarm in S8300 Media Server, on page 137 summarizes this server alarm.

Table 50: Virtual Alarm in S8300 Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MAJ	Virtual Analog Angel (VAA) loss of connectivity with a G700, resulting in temporary OOS of AUDIX ports. A G700 reboot caused VAA to "remove and re-insert" virtual board. Must be cleared manually. **1** Manually clear the alarm, either from the: — Web interface, by selecting **Alarms and Notification**, the appropriate alarm, and **Clear** — Linux command line, by entering **`almclear -n #id`** **2** Execute **list configuration all** on SAT. Verify that V8 MG MSG BOARD does not show `no board` against it. (`no board` means AUDIX ports OOS.)

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Remote Maintenance Board (RSB) Alarms

S8500 only

The Remote Supervisor Adapter (RSA) board is installed in PCI-X slot 1 of the S8500 Media Server. It monitors and reports alarms on S8500 components and software and provides control to power on and power off the server.

NOTE:
The S8500 has a set of alarms for the RSA card, which is also called the Remote Maintenance Board (RMB). The MO name is RMB.

Table 51: RMB Alarms in the S8500 Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
1	MIN	"RMB driver missing - handshake Failed" - The driver for communicating with the RSA card cannot be found. Several failures can generate this fault: • the Linux bash command **/sbin/lsmod** is missing • the results from running **/sbin/lsmod** could not be read • **/sbin/lsmod** returned nothing • the RSA device driver was not loaded • the RSA device driver does not exist The recommendations are: **1** Be sure **/sbin/ibmod** exists and is executable. **2** Be sure **/tmp** exists as a directory and can be written. **3** Be sure **/lib/modules/ibmasm/ibmasm.o** exists and has read permission. **4** Run the bash command "service ibmasm start".
2	MIN	"RMB cli is not loaded on the server." - The program that talks to the RSA card could not be found. Several failures generate this fault: • the Linus bash command **/bin/ls** is missing or not working properly • the bash command /opt/ecs/rmb/rsa/rsacli is missing or is not executable The resommendations are: **1** Be sure all the above files and directories exist and have read and execute permissions. **2** Reload any missing files from the distribution.

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Table 51: RMB Alarms in the S8500 Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
3	MAJ	"RMB reset command failed" - The RSA card did not respond to a reset command. Several failures generate this fault: • the bash command **opt/IBMmpcli/bin/mpcli** is missing or is not executable • the directory **/usr/java/latest** is missing or not symbolically linked to the Java runtime environment (JRE) • the file **/opt/ecs/rmb/rsareset** does not exist or cannot be read • no response from the RSA card • the RSA card did not execute the request The recommendations are: **1** Be sure all the above files and directories exist and have read and execute permissions. **2** Reload any missing files from the distribution. **3** Be sure the RSA card is installed by looking at the back and checking that the green power LED on the RSA card is on, and that the amber error LED is off. **4** Verify that the RSA card is working by dialing into it or logging on to it over the service's port of the RSA card. **5** Restart the RSA card from the RSA modem or service's port and check the LEDs on the back of the card. **6** Verify that the RSA card is plugged into the PCI-X slot of the server. **7** Verify that the flat ribbon cable from the RSA card to the server motherboard has been installed and is firmly seated in the connectors at both ends. **8** Replace the RSA card.

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Table 51: RMB Alarms in the S8500 Media Server

Event ID	Alarm Level	Alarm Text, Cause/Description, Recommendation
4	MAJ	"RMB failed handshake test" - The RSA card did not respond to commands from the server. Several failures generate this fault: • the bash command **/opt/IBMmpcli/bin/mpcli** is missing or is not executable • the directory **/usr/java/latest** is missing or not symbolically linked to the Java runtime environment (JRE) • the file **/opt/ecs/rmb/rsagetip1** does not exist or cannot be read • no response from the RSA card • the RSA card did not execute the request The recommendations are: **1** Be sure all the above files and directories exist and have read and execute permissions. **2** Reload any missing files from the distribution. **3** Be sure the RSA card is installed by looking at the back and checking that the green power LED on the RSA card is on, and that the amber error LED is off. **4** Verify that the RSA card is working by dialing into it or logging on to it over the service's port of the RSA card. **5** Restart the RSA card from the RSA modem or service's port and check the LEDs on the back of the card. **6** Verify that the RSA card is plugged into the PCI-X slot of the server. **7** Verify that the flat ribbon cable from the RSA card to the server motherboard has been installed and is firmly seated in the connectors at both ends. **8** Replace the RSA card.

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Alarms in the S8100 Media Server and Windows 2000 Log Events

S8100 only

Introduction

Alarms and Windows 2000 log events generated by the S8100 Media Server software are stored in the Application Log. This section describes the alarms that can be generated by the co-resident services running on the TN2314 Processor circuit pack, along with advice on how to resolve the alarms.

Co-Resident Services

This section describes the co-resident services.

Table 52: Co-Resident Services

Acronym	Description
GAM	The *global alarm module* (GAM) coordinates alarm reporting for the S8100 system. Its primary functions are to: • Accept and forward alarms from other applications • Generate alarms for Windows 2000 • Manage communication links to the Operations Support System (OSS) See Table 53, GAM Events, on page 142.
GAS	The *global administration subsystem* (GAS) provides • Command line access to administration and maintenance functions • Administration support for parameters in the S8100 system that are not provided elsewhere See Table 54, GAS Events, on page 143.
GSK	The *global sanity keeper* (GSK) ensures that all authorized Avaya applications are executing on an S8100 Media Server. Its major component is the Watchdog process. See Table 55, GSK Events, on page 145.
LAC	The *Lucent access control* software module (LAC) governs maintenance access to the Avaya application software. See Table 56, LAC Events, on page 149.
LIC	The *license server* (LIC) governs permission to execute software applications. See Table 57, LIC Events, on page 150.
VFM	The *virtual fabric manager* (VFM) translates Communication Manager protocols into S8100 methods and messages. See Table 58, VFM Events, on page 150.

Alarms for S8100 Co-Resident Services

All Co-Resident Services alarms reside in the Application Log (except for one in the GSK, see that section). All alarms are listed by their Event Source.

Table 53: GAM Events

Event ID	Alarm Severity	Description	Resolution
2	Minor	Modem failure. Either the modem is not working or is not connected.	**1** Verify modem is connected. **2** run prmaint add link to command test # **3** If problem persists, escalate.

Table 54: GAS Events

Event ID	Alarm severity	Description	Displayed error message	Resolution	Next Step
2	Minor	During backup, command cannot write to the destination add link in the PCMCIA card, or to a network disk.	Cannot write to *destination*	For PCMCIA: Check that PCMCIA card is plugged in and sane. Check permissions on PCMCIA (e: drive) For network disk: Check that f: is mapped to network. Check permissions on mapped network drive (f: drive).	
3	Minor	Archive command failed ”gasp” under d1 backup.	Archive command failed.	Escalate. Possible causes: internal software error, software version mismatch, possible disk corruption.	
12	Minor	“gasp” under d1backup command cannot write to destination.	Cannot write to destination.	For PCMCIA: Check that PCMCIA card is plugged in and sane. Check permissions on PCMCIA (e: drive) For network disk: Check that f:drive is mapped to network. Check permissions on mapped network drive (f: drive).	

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Table 54: GAS Events*Continued*

Event ID	Alarm severity	Description	Displayed error message	Resolution	Next Step
13	None	cp command under d1restore attempted to restore nonexistent file. The file: contrybackup/backup_ident on destination is missing.	*Filename* does not exist	locate correct file and reexecute command.	
15	none	D1 Restore command failed (caused by either gzip, cp permissions access contention, or hard drive space). Otherwise, one of the archive files in destination/contrybackup directory is corrupted.	Restore failed (*reason code*)	Escalate	
21	None	Bad or missing installation file	Bad or missing installation file	Re-install S8100. If problem persists, escalate to INADS to acquire new license file.	Install new license file. add link
22	None	Bad password file	Bad password file.	Re-install S8100. If problem persists, escalate to INADS to acquire new password file.	Install new password file. add link
23	None	Failed to add or delete a user in the system	Failed to add or delete a user in the system	Login ID does not have permission to perform operation.	
24	Major	Password file expired	Password file expired	Informed customer escalate to INADS	Escalate to INADS for new installation file.
25	Minor	Failed to retrieve serial number from firmware.	Failed to retrieve serial number from firmware.	Re-install S8100. If problem persists, escalate.	Replace firmware. (link TBA)

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Table 55: GSK Events

Event ID	Alarm Severity	Description	Resolution	Next Steps
1	None	Watchog started (Both System and Application logs)		N/A
2	None	Application *application_name* started		N/A
3	None	Application failed unexpectedly and has restarted. Application *application_name* terminated. Executing recovery script (if any) and restarting. Retry Count = *nn*. Could not start application *application_name*. Retrying (retry count = *nn*).		Examine log files for failure reasons. Escalate to Tier 4 or report to development.
4	Major	Watchdog Initiated Reboot. Sanity Timeout to Firmware. System will reboot.	Escalate	Record external activity prior to reboot. Provide system log files to development.
5	Major	Application Total Failure **1** Application *application_name* totally failed. **2** Executable *filename* of application *application_name* not found	Restart S8100. If problem persists, escalate.	**1** Restart application with "start" command. Examine log files for failure reason. Report to development. **2** Restart application using correct executable.
6	Minor	Cannot open log file *watchdog_log_file_name*.	Escalate	**1** Copy corrupted watchdog log file to another location, then remove it from the original location. When the system is restarted, a new log file will be created. **2** Provide copy of corrupt log file to development.

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Table 55: GSK Events*Continued*

Event ID	Alarm Severity	Description	Resolution	Next Steps
7	Minor	Internal Software Error **1** Internal Software Error. Clean Shutdown not possible for application *application_name*. **2** Internal Software Error. Orderly System Shutdowns Affected **3** Cannot access registry. No protection against continuous reboots.	Restart S8100 at a convenient time. If problem persists, escalate.	**1** Provide log files to development. Arrange a planned system restart at a time when system is the least busy. **2** Provide log files to development.
8	Major	Watchdog Failure: **1** Watchdog initialization failed. Internal Software Error. Applications will not start. **2** Watchdog initialization failed. Cannot read configuration file *filename.* Applications will not start. **3** Watchdog failed. Internal Software Error. System may reboot.	Escalate	**1** Contact development. Provide watchdog log file. **2** Replace watchdog configuration file. **3** Contact development. Provide log files.

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Table 55: GSK Events*Continued*

Event ID	Alarm Severity	Description	Resolution	Next Steps
9	None	Watchdog Request: **1** Addproc request received for application *application_name*. **2** Addwatch (registration) request received for application *application_name*. **3** Delwatch (un-registration) request received for application *application_name*.		Information event only. No action required.
10	None	Process *process_name* missed a heart beat.		Examine log files for failure reasons. Escalate to Tier 4 or report to development.
11	Minor	Recovery script not found **1** Recovery script *filename* for application *application_name* not found **2** Fail script *filename* for application *application_name* not found	Escalate	**1** Arrange a planned application or system restart at a time when system is the least busy. **2** Ensure correct script name is used on restart.
12	None	Watchdog cannot start. Another watchdog may be running or another application has opened watchdog log file. Cannot rename file from *old_filename* to *new_filename*.		If another watchdog is running, do not attempt to start watchdog without first shutting it down in an orderly manner (fro example, via the **shutdownproc** command.) If the watchdog log file is open (for example, is being viewed), close it and then attempt to start watchdog again. Otherwise, contact development and provide watchdog log file.

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Table 55: GSK Events*Continued*

Event ID	Alarm Severity	Description	Resolution	Next Steps
13	None	Application *application_name* has been shut down		N/A
14	Major	System continuously rebooting Exceeded the maximum allowable number of system reboots. Watchdog exited	Escalate	Contact development. Provide log files.
15	None	All applications have been shut down		N/A
50	Major	Firmware download failure	Firmware download program could not talk to watchdog. Applications will not start.	Contact development. Provide Avaya log file.
51	Minor	Firmware download failure (Bad boot)	Downloadable boot firmware is invalid. Firmware is running in permanent boot code because all previous attempts to download application firmware using downloadable boot firmware failed.	Contact development. Provide Avaya log file.

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Table 56: LAC Events

Event ID	Alarm Severity	Displayed Error Message	Resolution
1	None	*User* attempting login	Informational
2	None	*User* has been locked out	Informational
5	None	Unable to open lac file or invalid lac file	Reinstall license file using loadlicense
6	None	Lac Login file not available	Reinstall license file using loadlicense
7	None	Password file expired	Reinstall license file using loadlicense
8	Minor	Failed to get firmware serial number	Replace TN2314 Processor Board. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.
9	None	Sanity event not opened	Informational - escalate
10	Major	Invalid login	Reinstall license file using loadlicense
11	None	Error cannot connect to Communication Manager	escalate
12	None	Error cannot connect to INTUITY AUDIX	escalate

Table 57: LIC Events

Event ID	Alarm Severity	Description	Resolution	Next Step
1	Major	Corrupted or missing license file	Re-install S8100. If problem persists, escalate.	Copy in a valid license file.
2	Major	License file expired.	Escalate	Replace licence file.
3	Major	Failed to retrieve serial number from firmware	Escalate	Check firmware
5	None	License denied	Check serial number. Add link	

Table 58: VFM Events

Event ID	Alarm Severity	Description	Resolution	Next Step
1	Minor	Unable to start timer The system will still operate with this alarm. Scheduled maintenance will not run	Restart S8100 at your convenience. If step one does not resolve the problem, see step 2 link to procedure for restarting.	**1** Restart VFM add link to procedure). **2** Restart system
3	Minor	VFM unable to open configuration file	The system will operate with the following restrictions: • INTUITY AUDIX is down. • ISDN cards are down. Re-install S8100 at your convenience. If problem persists, see add link.	**1** Check config file in C:\LucentSoftware\ Definity\vfm.cfg. **2** Verify config file entries are correct. **3** Restart VFM. **4** Restart system.

Windows 2000 Generated Alarm Information

All Windows 2000 Generated alarms reside in the System Log.

Table 59: Windows 2000 Alarms

Event Source	Event ID	Alarm Severity	Description	Resolution	Next Steps
Srv	2001	Major	The server was unable to perform an operation due to a shortage of available resources.	Escalate	Look for a vagrant application in task manager. The page file has reached the maximum page file size and there are no more pages available, either in main memory or in the page file. This generally indicates a memory leak in a another process.
Srv	2002	Major	The server could not create its device. The server could not be started.	Escalate	The server was started on a computer that does not have any memory free.
Srv	2003	Major	The server could not create a process. The server could not be started.	Escalate	The server was started on a computer that does not have any memory free.
Srv	2004	Major	The server could not create a startup thread. The server could not be started.	Escalate	The server was started on a computer that does not have any memory free.
Srv	2010	Major	The server could not start the scavenger thread. The server could not be started.	Escalate	The server was started on a computer that does not have any memory free.
Srv	2012	Major	The server has encountered a network error.	Escalate	If you see many errors of this type in the event log in Event Viewer, they indicate a network hardware or software problem.

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Table 59: Windows 2000 Alarms*Continued*

Event Source	Event ID	Alarm Severity	Description	Resolution	Next Steps
Srv	2020	Major	The server was unable to allocate from the system paged pool because the pool was empty.	Escalate	The page file has reached the maximum page file size and there are no more pages available, either in main memory or in the page file. This generally indicates a memory leak in a another process.
Srv	2013	Major	The *disk_name* disk is at or near capacity.	Escalate	You may need to delete some files. Look for oversized log files. Look for unusually large INTUITY AUDIX mailboxes (If necessary send broadcasters delete messages)
Srv	2501	Minor	The server's Registry key %1 was not present. The server could not start.	Escalate	The Registry is corrupted.
Srv	2502	Minor	The server's Registry key *key_name* was not present and could not be created. The server could not start.	Escalate	The Registry is corrupted.
ndis	5000	Minor	*Driver_name*: Has encountered a conflict in resources and could not load.	Escalate	The network driver failed to initialize due to an apparent conflict between the adapter card and some other hardware.
ndis	5006	Minor	*Driver*: The version number is incorrect for this driver.	Escalate	The network driver version number is incompatible with this operating system.

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Table 59: Windows 2000 Alarms*Continued*

Event Source	Event ID	Alarm Severity	Description	Resolution	Next Steps
Qic117	151	Minor	The driver could not allocate memory for data transfer buffers. Try restarting the system. If this error persists, more system RAM may be required. From device: *device_name.*	Escalate	
RAS PPTP	1	Minor	Unable to open registry key path for the RAS PPTP driver.	Escalate	
serial	8	Minor	Not enough resources were available for the driver.	Escalate	
Various	41	Major	The file system structure on the disk is corrupt and unusable. Please run the chkdsk utility on the device *device_name* with label "*label*".	Escalate	

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4 G700 Media Gateway Traps

This chapter applies to the G700 Media Gateway only.

SNMP Alarming on the G700

Setting up SNMP alarm reporting involves two main tasks:

- Configure the primary server to report alarms
- Configure the G700 to Send its Traps to the Primary Server

Configure the primary server to report alarms

The primary server may be either an S8300 Media Server or an S8700 Media Server. The Media Server supports two methods for reporting alarms. Either method, both, or no alarm-reporting method may be used at a given site.

- OSS Method. The server's software applications and hardware devices under its control can generate Operations Support System (OSS) alarms. These alarms are recorded in the server logs, and may be reported to Avaya's Initialization and Administration System (INADS) or another services support agency over the server's modem interface.

  To activate OSS alarm notification: The server requires a USB connection to a modem that is connected to an analog line. The modem must be configured using the Web Interface, in the Set Modem Interface screen, and enabled to send and receive calls using the Enable/Disable Modem screen. Configuration of the OSS alarming method can only be done using Linux shell commands.

- SNMP Method. SNMP traps may be sent in User Datagram Protocol (UDP) to a corporate network management system (NMS) using the Configure Trap Destinations screen. The OSS and SNMP alarm-notification methods operate independently of each other. Either or both may be used. Currently, the following NMSs are supported:

  - Avaya Communication Manager Fault and Performance Manager, as a standalone application, or integrated within
  - Avaya MultiService Network Manager
  - HP Openview

  To activate SNMP alarm notification: On the server Web Interface, use the Configure Trap Destinations screen to set up SNMP destinations in the corporate NMS.

Add INADS Phone Numbers and Enable Alarms to INADS

The following procedure using the primary server's Linux shell commands administers the dial-out modem to send alarms in the OSS method. In this example, the primary server is an S8300, and the services support agency is Avaya's Initialization and Administration System (INADS).

Perform this task after all Communication Manager administration is complete.

To add INADS phone numbers and enable alarms to INADS

1 Connect your laptop to the Services port of the S8300 Media Server

> **NOTE:**
> Do these steps only if the S8300 is the primary controller and the customer has a maintenance contract with Avaya. Use the information acquired from the ART tool (see "*Run the ART Tool for the INADS IP Address*" in Chapter 3 of "*Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 or S8700 Media Server, 555-234-100*"). Also, a USB modem must have already been installed. See "*Universal Serial Bus (USB) Modems*" in Chapter 7 of the same source.

2 Click **Start > Run** to open the Run dialog box

3 Type **telnet 192.11.13.6** and press **Enter**.

4 Log in as **craft**.

5 At the prompt, type **almcall -f *INADS phone number* -s *second-number*** and press **Enter**.

6 At the prompt, type **almenable -d b -s y** and press **Enter**.

7 Type **almenable** and press **Enter** to verify that the alarms are enabled.

8 Log off.

Configure the G700 to Send its Traps to the Primary Server

Configuring the G700 Media Gateway to send SNMP traps to the primary server can be accomplished by two commands:

- Layer 2 Switching Processor CLI command: **set snmp community trap [community string]**
- Media Gateway Processor (MGP) CLI command: **set snmp trap <IP address> enable**

Configure an SNMP community string for traps

SNMP requires community strings to be used for each SNMP "request". You can set only three community strings on the G700 — one each for read requests, write requests, and traps. The command for traps is **set snmp community trap [community string]**.

To configure an SNMP community string for traps

1 Open the Run dialog box.

2 Type **telnet <*IP address of L2 Processor*>** and press **Enter**.

3 Log in as **root**.

4 At the L2 Processor CLI prompt, type **set snmp community trap *[community string]*** and press **Enter**.

5 Type **exit**

Configure the destination for G700 SNMP traps

Events occurring on the G700 cause SNMP traps to be generated. The G700 MGP can be configured to send SNMP traps to any network management system (NMS) in the network, including the primary server (S8300/S8700). The MGP CLI **set snmp trap** command is the way to configure the NMS network element that will receive those traps. The traps are sent in User Datagram Protocol (UDP) on the customer's IP network.

The command syntax is:

set SNMP trap *<IP address> {enable|disable} [{all|power|temp|app|module|config|voice|operations}]*

where ***<IP address>*** is the IP address of the NMS trap receiver that will be receiving the traps from the G700, and

[{all|power|temp|app|module|config|voice|operations}] indicates the groups whose traps will be sent to the specified receiver. If no keywords follow the IP address entry, then all traps will be enabled for the specified receiver.

If "enable" or "disable" is used without a trap designation keyword, then all traps is assumed. Up to ten trap receivers can be configured.

To configure the destination for G700 SNMP traps

1. From the L2 Processor CLI, type **session mgp**
2. At the **mg-xxx-n(super-user)** prompt, type **configure** and press **Enter**.
3. At the **mg-xxx-n(configure)** prompt, type **set snmp trap <*IP address*> *enable*** and press **Enter**.
4. Type **exit**

G700 Alarm Format

G700 Media Gateways (serving either as standalone port networks, or as port networks within an IP or a Multi-Connect system) report alarms to the primary server (either an S8300 or S8700 Media Server) using SNMP traps. Like the primary server's own alarms, alarms from a G700 Media Gateway:

- Reside in the primary server's alarm log
- Can be viewed using the SAT command **display alarms**
- Can be viewed using the Web Interface Display Alarms option

However, the format of these displayed alarms is slightly different. Using the G700 MO's Event ID #1 (the first entry in Table 60, G700 Alarms (SNMP Traps) to the Primary Media Server, on page 159) as an example, a displayed G700 alarm has the following format:

n CMG 1 WRN 07/17/2002:13:45 121.1.1.2:cmgMultipleFanFault

Within the previous alarm-display string, the value:

- "n" is a sequential alarm ID.
- "CMG" identifies a G700 Media Gateway as the MO.
- "1" is the event's ID (1st column of Table 60, G700 Alarms (SNMP Traps) to the Primary Media Server, on page 159).

This table also contains each alarm's corresponding SNMP trap # in the 2nd column of Table 60, G700 Alarms (SNMP Traps) to the Primary Media Server, on page 159. However, many of the MIB-defined traps have been excluded, either because:

- A specific trap (such as, Trap #3) is the SNMP mechanism to clear an alarm logged by another specific trap (in this case, Trap #2).
- The specific event indicated by a trap is not severe enough to justify an entry in the primary server's alarm log.
- A trap is defined, but not implemented.
- A trap # is reserved for future use.

- "WRN" is the event's severity (3rd column of Table 60, G700 Alarms (SNMP Traps) to the Primary Media Server, on page 159).
- "07/17/2002:13:45"is the event's date and time stamp.
- "121.1.1.2"is the IP address for Telnet access to the alarmed G700 Media Gateway Processor (MGP).
- "cmgMultipleFanFault" is an alarm description (4th column of Table 60, G700 Alarms (SNMP Traps) to the Primary Media Server, on page 159).

G700 Traps and Resolutions

Although these alarms can be viewed from the primary server, they are normally resolved from within the G700 Media Gateway. The G700 generates the following traps. Follow the error resolution procedures in

Table 60, G700 Alarms (SNMP Traps) to the Primary Media Server, on page 159 to resolve errors indicated by these traps.

Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
1	2	WRN	cmgMultipleFanFault — At least two G700 fans have been operating at less than 90% of their nominal speed for >= 5 minutes. (This may be an early warning of overheating.) **1** Verify there are faults in the system. Use the Avaya G700 Media Gateway Processor (MGP) Command Line Interface (CLI) command **show faults** to display any faults on the G700. **2** If there is a fan/temperature fault, check to see if the fans are working, and/or if there is sufficient space around the G700 for air circulation. **3** Maintenance software monitors voltages applied to the Media Modules and other components of the G700, and compares these to the general power supply unit (PSU) status bit. If none of these voltages are out of tolerance, but the PSU status indicates failure, this generates the fan fault, which will be indicated in the **show faults** command output. Replace the entire G700. Fans and the PSU are not field replaceable.
2	4	MIN	cmgPsuBriefFanFault — A G700's PSU fan has been operating at less than 90% of its nominal speed for between 5 and 15 minutes. (This may be an early warning of overheating.) **1** Verify there are faults in the system. Use the Avaya G700 Media Gateway Processor (MGP) Command Line Interface (CLI) command **show faults** to display any faults on the G700. **2** If there is a fan/temperature fault, check to see if the fans are working and/or if there is sufficient space around the G700 for air circulation. **3** Maintenance software monitors voltages applied to the Media Modules and other components of the G700, and compares these to the general power supply unit (PSU) status bit. If none of these voltages are out of tolerance, but the PSU status indicates failure, this generates the fan fault, which will be indicated in the **show faults** command output. Replace the entire G700. Fans and the PSU are not field replaceable.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
3	6	MIN	cmgPsuProlongedFanFault — A G700's fan has been operating at less than 90% of its nominal speed for >= 15 minutes. (This may be an early warning of overheating.) **1** Verify there are faults in the system. Use the Avaya G700 Media Gateway Processor (MGP) Command Line Interface (CLI) command **show faults** to display any faults on the G700. **2** If there is a fan/temperature fault, check to see if the fans are working and/or if there is sufficient space around the G700 for air circulation. **3** Maintenance software monitors voltages applied to the Media Modules and other components of the G700, and compares these to the general power supply unit (PSU) status bit. If none of these voltages are out of tolerance, but the PSU status indicates failure, this generates the fan fault, which will be indicated in the **show faults** command output. Replace the entire G700. Fans and the PSU are not field replaceable.
4	10	MIN	cmgCpuTempWarningFault — A G700's CPU temperature sensor has exceeded its warning threshold. **1** Verify there are faults in the system. Use the Avaya G700 Media Gateway Processor (MGP) Command Line Interface (CLI) command **show faults** to display any faults on the G700. **2** If there is a temperature fault, turn off the G700 and allow it to cool. **3** Reboot the G700. Check to see if the fans are working and/or if there is sufficient space around the G700 for air circulation. Use the MGP CLI **show faults** command to check for fan problems. **4** Low voltage may be responsible for slower fans. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. If there are no fan faults, use the MGP CLI command **show voltages** to display voltages applied to components on the motherboard and to the Media Modules. **5** If the Media Module voltage is out of tolerance, systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage level. If one is found, replace the Media Module. **6** If no Media Module is found to be bad, the power supply is suspect. Replace the G700.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
5	12	MIN	cmgDspTempWarningFault — The temperature sensor in a G700's DSP complex has exceeded its warning threshold. **1** Verify there are faults in the system. Use the Avaya G700 Media Gateway Processor (MGP) Command Line Interface (CLI) command **show faults** to display any faults on the G700. **2** If there is a temperature fault, turn off the G700 and allow it to cool. **3** Reboot the G700. Check to see if the fans are working and/or if there is sufficient space around the G700 for air circulation. **4** Low voltage may be responsible for slower fans. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. If there are no fan faults, use the MGP CLI command **show voltages** to display voltages applied to components on the motherboard and to the Media Modules. **5** If the Media Module voltage is out of tolerance, systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage level. If one is found, replace the Media Module. **6** If no Media Module is found to be bad, the power supply is suspect. Replace the G700.
6	14	MAJ	cmgTempShutdownFault — The temperature sensor in a G700's CPU has exceeded its shutdown threshold. The system is about to begin controlled shutdown. **1** Verify there are faults in the system. Use the Avaya G700 Media Gateway Processor (MGP) Command Line Interface (CLI) command **show faults** to display any faults on the G700. **2** If there is a temperature fault, turn off the G700 and allow it to cool. **3** Reboot the G700. Check to see if the fans are working and/or if there is sufficient space around the G700 for air circulation. **4** Issue MGP CLI command **show voltages** to determine voltages for Media Modules and other components of the G700. While the +12V fan supply is not directly monitored, it is included in the general power supply unit (PSU) status bit. Use the **show faults** command to determine if there is a fan problem. If none of the monitored voltages are out of tolerance, but the PSU status indicates failure, this would generate a fan fault. If fans are faulty, then replace the entire G700. Fans are not field replaceable. **5** Voltage may also be reduced by a short in one of the Media Modules. Systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage levels.

Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
7	16	MAJ	cmgMgpPowerFault — The voltage reading at the server's +5.1V power source is out of tolerance. **1** Check voltages. Issue the MGP CLI command **show voltages** to determine voltages for Media Modules and other components of the G700. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. **2** Systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage levels. Replace faulty Media Module. **3** If the alarm clears in 10-20 seconds, it was a probable voltage spike. Do not replace the G700. Use a power monitor to monitor the power line. **4** If a brown-out condition is suspected, use a power monitor to monitor the power line. **5** If the fault persists and the **show voltages** command continues to show the level is out of tolerance, then replace the G700.
8	18	MAJ	cmgMediaModulePowerFault — The voltage reading at the Media Modules' -48V power source is out of tolerance. **1** Check voltages. Issue the MGP CLI command **show voltages** to determine voltages for Media Modules and other components of the G700. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. **2** Systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage levels. Replace faulty Media Module. **3** If the alarm clears in 10-20 seconds, it was a probable voltage spike. Do not replace the G700. Use a power monitor to monitor the power line. **4** If a brown-out condition is suspected, use a power monitor to monitor the power line. **5** If the fault persists and the **show voltages** command continues to show the level is out of tolerance, then replace the G700.

Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
9	20	MAJ	cmgVoipPowerFault — The voltage reading at the VoIP complexes' +3.4V power source is out of tolerance. **1** Check voltages. Issue the MGP CLI command **show voltages** to determine voltages for Media Modules and other components of the G700. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. **2** Systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage levels. Replace faulty Media Module. **3** If the alarm clears in 10-20 seconds, it was a probable voltage spike. Do not replace the G700. Use a power monitor to monitor the power line. **4** If a brown-out condition is suspected, use a power monitor to monitor the power line. **5** If the fault persists and the **show voltages** command continues to show the level is out of tolerance, then replace the G700.
10	22	MAJ	cmgDspPowerFault — The voltage reading at the DSP units' +1.58V power source is out of tolerance. **1** Check voltages. Issue the MGP CLI command **show voltages** to determine voltages for Media Modules and other components of the G700. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. **2** Systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage levels. Replace faulty Media Module. **3** If the alarm clears in 10-20 seconds, it was a probable voltage spike. Do not replace the G700. Use a power monitor to monitor the power line. **4** If a brown-out condition is suspected, use a power monitor to monitor the power line. **5** If the fault persists and the **show voltages** command continues to show the level is out of tolerance, then replace the G700.

Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
11	24	MAJ	cmg8620PowerFault — The voltage reading at the VoIP Processor's +2.5V power source is out of tolerance. **1** Check voltages. Issue the MGP CLI command **show voltages** to determine voltages for Media Modules and other components of the G700. Voltage may be reduced by a short in one of the Media Modules or a bad power supply. **2** Systematically, remove each Media Module to determine if one of the Media Modules is responsible for reducing the voltage levels. Replace faulty Media Module. **3** If the MM760 Media Module is not present, the VoIP engine on the motherboard is possibly bad. Use the **show faults** command to check for VoIP faults. Replace the G700. **4** If the alarm clears in 10-20 seconds, it was a probable voltage spike. Do not replace the G700. Use a power monitor to monitor the power line. **5** If a brown-out condition is suspected, use a power monitor to monitor the power line. **6** If the fault persists and the **show voltages** command continues to show the level is out of tolerance, then replace the G700.

Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
14	30	MAJ	cmgSyncSignalFault — Synchronization signal lost. **1** Check that provisioned clock-sync source has a good signal by issuing a Media Gateway Processor (MGP) Command Line Interface (CLI) command **show sync timing** Procedure for setting synchronization timing sources on T1/E1 MM or MM710: **1** Be sure that the T1/E1 MM has been added properly on the Avaya S8300 Media Server or Avaya S8700 Media Server, otherwise go to System Access Terminal (SAT) and issue a **ADD DS1** command before going to the MGP CLI and issuing a **set sync interface** or **set sync source** command. Otherwise the MGP CLI will not allow these commands to be executed. **2** Go to the MGP's CLI, and first specify the primary and secondary clock sources for synchronizing the T1/E1 span, using the **set synch interface** command. Note: You don't specify the internal clock source from the CLI - only the primary and secondary. The local clock is "built-in" and not provisionable. **3** Issue a **set sync source** command to set to the specific MM710 T1/E1 Media Module to be used as the active clock reference. **4** Verify whether or not these commands were executed by issuing a **show sync timing** command to ensure that the source is provisioned and active, or visually inspect the Yellow LED on the MM710 Media Module. Note: When the Yellow LED is on 2.7 seconds and off 0.3 seconds, this means the tone-clock synchronizer is in "active" mode, and an external synchronization source is being used as a synchronization reference. Setting the sync timing was successful. When the Yellow LED is on 0.3 seconds and off 2.7 seconds, this means the tone-clock synchronizer is in "active" mode and the internal (on-board) clock is being used as a synchronization reference. Setting the sync timing was not successful. **5** If there is more than one MM710 Media Module, and they have been set up as primary and secondary, this behavior could be on the second and not the timing of the bus. For more details, please consult the maintenance documentation under LEDs and T1/E1 Media Module, or see http://support.avaya.com/elmodocs2/S8300/cd/index.htm
15	32	MAJ	cmgVoipHardwareFault — A DSP complex serving the VoIP engines has failed. **1** Check IP configuration. **2** Reset or replace Media Module.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
	50		cmgModuleRemove — A Media Module has been removed.
16	51		Reserved
	52		cmgModuleInsertFault — The insertion sequence for a Media Module has failed.
	53		cmgModuleInsertSuccess — A Media Module has been inserted.
	54		cmgMgBusyout — An administrator has busied-out a Media Module or a port.
	55		cmgMgRelease — An administrator has returned a busied-out media module or port back into service.
	56 – 69		Reserved
	74		cmgFirmwareDownloadBegun — A Media Gateway began downloading a software module.
	75		cmgModuleManualReset — A Media Module is beginning a user-requested reset operation.
	76		cmgVoipManualReset — A VoIP engine is beginning a user-requested reset operation.
	77		cmgDsuManualReset — An E1 or T1's DSU is beginning a user-requested reset operation.
	78		cmgConfigUploadBegun — A Media Gateway began uploading a configuration file.
	79		cmgConfigUploadSuccess — The Media Gateway successfully uploaded the configuration file.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
17	90	MAJ	cmgMemoryFault — The Media Gateway Processor has detected a low processor memory condition. If an attempt by a software module to allocate memory fails, or if available memory falls below four million bytes, this trap is generated. If available memory later rises above five million bytes, this trap is cleared. If available memory falls below a half a million bytes, the Media Gateway Processor is automatically reset. **1** Check the Media Gateway Processor and insure that it has the latest version of firmware installed. If it does not, install the latest version of firmware and continue to monitor. **2** If this trap occurs infrequently and is automatically cleared, the trap may be due to an unusual transient condition. Monitor future traps. **3** If this trap occurs frequently and is automatically cleared, it is likely that the Media Gateway Processor software has the wrong limits set for its memory monitoring. These limits are hard coded in the software. Escalate. **4** If this trap occurs and does not clear, the Media Gateway may be functionally impaired. Do not reset the Media Gateway. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis. **5** If this trap occurs and the Media Gateway Processor automatically resets, then a severe processor memory shortage occurred. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis.
18	92	MAJ	cmgDhcpRequestFault — The Media Gateway cannot contact its DHCP server, or the DHCP server did not respond to a request. **1** Either correct the DHCP problem, or correct the Media Module's configuration file.
19	94	MAJ	cmgFirmwareDownloadFault — An attempt to download a software module has failed. **1** Check the event log to find the specific error. **2** Troubleshoot the specific error according to the information found. For example, if the string "File not found" appears in the log, then verify that the image file: **by** Exists **bz** Has the correct name **ca** Resides in the correct directory

Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
20	96	WRN	cmgProcessRestart — a software module on the Media Gateway Processor failed. The Media Gateway Processor will attempt to restart the failing module. A successful restart of the module will clear this trap **1** Check the Media Gateway Processor and insure that it has the latest version of firmware installed. If it does not, install the latest version of firmware and continue to monitor. **2** If this trap occurs infrequently and is automatically cleared, the trap may be due to an unusual transient condition.Monitor future traps. **3** If the trap occurs frequently and is automatically cleared, it may indicate an issue with a particular software module. Reset the Media Gateway at a time convenient with the customer. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis. **4** If the trap occurs and does not clear, the Media Gateway may be functionally impaired. Reset the Media Gateway at a time convenient with the customer and consistent with the impairment. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis.
21	98	MAJ	cmgIccMissingFault — An internal communications controller, expected in Slot 1, is missing. **1** Check for presence of S8300. **2** If present, check the G700 administration. **3** If the administration is correct, suspect the S8300.
22	100	MAJ	cmgIccAutoReset — The Media Gateway automatically reset the internal communications controller. **1** If the problem persists, escalate.
23	102	MAJ	cmgPrimaryControllerFault — The Media Gateway cannot contact the first controller in its controller list. **1** Verify that the controller list is correct. From the MGP CLI, issue the command **show mgc list**. The IP address should match the S8700 Media Server CLAN or the S8300 Media Server IP addresses. **2** If needed, correct this in 'configure' mode on the MGP's CLI by clearing the mgc list first with the **clear mgc list** command, and then issuing a **set mgc list** with the correct IP addresses. **3** If so, verify that the primary controller is up. **4** If so, shut down every LSP.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
24	104	MAJ	cmgNoControllerFault — The Media Gateway does not have any controllers in its controller list. **1** Verify that the controller list is empty. From the MGP CLI, issue the command **show mgc list** to verify that there are no controllers listed. **2** If none are listed, correct this by adding the correct IP address of the S8700/S8300. In 'configure' mode on the MGP's CLI, issue a **set mgc list** command with the correct IP address.
25	106	MAJ	cmgRegistrationFault — The Media Gateway cannot register with any controllers in its controller list. **1** Verify that the controller list is correct. From the MGP CLI, issue the command **show mgc list**. The IP address should match the S8700 Media Server CLAN or the S8300 Media Server IP addresses. **2** If needed, correct this in 'configure' mode on the MGP's CLI by clearing the mgc list with the **clear mgc list** command, and then issuing a **set mgc list** with the correct IP addresses. **3** If the IP address in the mgc list matches the S8700 Media Server CLAN or the S8300 Media Server IP addresses, there may be a network problem. **4** Verify that the primary controller is up.
26	108	MIN	cmgH248LinkDown — An H.248 link between the Media Gateway and its controller is down. **1** Check the S8300 or S8700. **2** If down, bring up. **3** If **not**, check the G700 administration. Since the following command causes a brief service outage, it should only be executed at the customer's convenience. **4** If the administration is correct, reboot the G700. **5** If the problem persists, check network connectivity. Use **ping** or **traceroute** to the S8300/S8700 to check connectivity. **6** If the problem persists, escalate.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
29	114	WRN	cmgMgAutoReset — The Media Gateway Processor automatically reset (rebooted). The processor automatically resets when a critical error occurs from which it cannot recover. The error may be software or hardware related. It may also automatically reset in response to a maintenance test running on the call controller. (A reset performed at the request of a SAT or CLI command entered by craft or Tier technical support generates a different trap indicating a manual reset.) Finally, it may automatically reset when it reregisters with a call controller after being out of touch for too long. This trap is generated as the Media Gateway Processor comes back up after resetting. If the Media Gateway Processor resets and fails to come back up, this trap will not be generated. **1** Check to see if a maintenance test that is supposed to reset the processor was run. **2** Check that the reset was not due to the link with the call controlling going down. If the reset is due to a link failure with the call controller, follow call controller link failure troubleshooting procedures. **3** Check the Media Gateway Processor and insure that it has the latest version of firmware installed. If it does not, install the latest version of firmware and continue to monitor. **4** If this trap occurs infrequently, the trap may be due to an unusual transient condition. Monitor future traps. **5** If this trap occurs and the Media Gateway Processor is frequently resetting, manually reset the media gateway. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis. **6** If this trap occurs frequently and the Media Gateway Processor is not resetting, the Media Gateway may be functionally impaired, and is not capable of resetting itself to restore service. If service is impaired, reset the Media Gateway manually. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
30	116	WRN	cmgModuleAutoReset — A Media Module in the Media Gateway automatically reset (rebooted). A Media Module automatically resets when it fails a sanity test performed by the Media Gateway Processor. It may also automatically reset in response to a maintenance test running on the call controller. (A reset performed at the request of a SAT or CLI command entered by craft or Tier technical support generates a different trap indicating a manual reset.). **1** Check to see if a maintenance test that is supposed to reset the Media Module was run. **2** Check the Media Module and insure that it has the latest version of firmware installed. If it does not, install the latest version of firmware and continue to monitor. **3** If this trap occurs infrequently, the trap may be due to an unusual transient condition. Monitor future traps. **4** If this trap occurs and the Media Module does not return to service, or if this trap occurs frequently, attempt to reset the failing module from the SAT or CLI and see if this returns it to stable service. **5** If manually resetting the Media Module does not return it to service, and if a spare Media Module of the same time is available, replace the failing Media Module with the spare and see if the spare Media Module goes into service. If so, follow procedures for dealing with the original, bad, Media Module. **6** If the spare Media Module fails to go into service, it is of course possible that the spare Media Module is bad as well. But that aside, try manually resetting the Media Gateway Processor at a time convenient to the customer and see if this restores service. If so, the both the original and the spare Media Modules can probably be considered okay, and the problem is probably with the Media Gateway Processor itself. Escalate and have Tier 3 personnel capture the trap information and the event logs for analysis.
32	118	MIN	cmgModulePostFault — A Media Module failed its power-on start-up test. **1** Reset or replace the Media Module.

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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
34	122	MAJ	cmgConfigUploadFault — An attempt to upload a configuration file failed. **1** Check the event log for an error message during the backup/restore process. **2** Troubleshoot the specific error according to the information found. **3** Retry the upload (backup) command; for example: copy mgp-config tftp <filename> <ip address> Since the following command causes a brief service outage, it should only be executed at the customer's convenience. **4** If the problem persists, reboot the G700.
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Table 60: G700 Alarms (SNMP Traps) to the Primary Media Server

Event ID	Trap #	Alarm Level	Description / Recommendation
37	128	WRN	cmgVoipAutoReset — A VoIP (Voice Over IP) module in the Media Gateway automatically reset (rebooted). A VoIP module automatically resets when it fails a sanity test performed by the Media Gateway Processor. It may also automatically reset in response to a maintenance test running on the call controller. (A reset performed at the request of a SAT or CLI command entered by craft or Tier technical support generates a different trap indicating a manual reset.) It automatically resets when its IP address is administered. Finally, it automatically resets when it fails a ping test performed by the Media Gateway Processor against the VoIP module's IP address. **1** Check to see if a maintenance test that is supposed to reset the VoIP module was run. **2** Check to see if the VoIP module had its IP address re-administered. **3** Check to see if the IP address administered on the VoIP module is correct. **4** Check to see if the IP address of the Media Gateway itself can be pinged. Physical or logical connectivity issues (cabling or routing problems) in the data network can cause ping failures. **5** Check the VoIP module and insure that it has the latest version of firmware installed. If it does not, install the latest version of firmware and continue to monitor. **6** If this trap occurs infrequently, the trap may be due to an unusual transient condition. Monitor future traps. **7** If this trap occurs and the VoIP module does not return to service, or if this trap occurs frequently, attempt to reset the failing module from the SAT or CLI and see if this returns it to stable service. **8** If manually resetting the VoIP module does not return it to service, and if a spare VoIP module of the same type is available, replace the failing VoIP module with the spare and see if the spare VoIP module goes into service. If so, follow procedures for dealing with the original, bad, VoIP module. **9** If the spare VoIP module fails to go into service, it is of course possible that the spare VoIP module is bad, as well. There may be a power issue, also. **10** Try manually resetting the Media Gateway Processor at a time convenient to the customer and see if this restores service. If so, both the original and the spare VoIP modules can probably be considered okay, and the problem is probably with the Media Gateway Processor itself. Capture the trap information. If possible, capture the event logs, using the **show event-log** CLI command, for analysis. Escalate. **11** If none of this works, capture the trap information. If possible, capture the event logs, using the **show event-log** CLI command, for analysis. Escalate.

5 Communication Manager Maintenance-Object Repair Procedures

NOTE:
This chapter contains neither maintenance objects (MOs) for the DEFINITY Wireless Business System (DWBS), nor MOs for messaging systems. Refer to the maintenance documentation that accompanies these products for this information.

The Communication Manager maintenance subsystem is partitioned into separate entities called Maintenance Objects (MOs). A maintenance object can be:

- An individual circuit pack or media module
- A hardware component that is part of a circuit pack or media module
- An entire subsystem
- A set of monitors
- A process (or set of processes)
- A combination of processes and hardware

“Maintenance names” are recorded in the Error and Alarm logs. Individual copies of an MO are assigned an address that defines the MO’s physical location in the system when applicable. These locations display as the **port** field in the Alarm and Error logs and as output of various commands such as **test board (see** Figure 20, Display of test board command, on page 176**).**

Figure 20: Display of test board command

test board 1v4 long Page 1

TEST RESULTS

Port	Maintenance Name	Alt. Name	Test No.	Result	Error Code
001V4	MG-DS1		50	ABORT	1412
001V4	MG-DS1		52	PASS	
001V4	MG-DS1		138	PASS	
001V4	MG-DS1		139	PASS	
001V4	MG-DS1		140	PASS	
001V4	MG-DS1		141	PASS	
001V4	MG-DS1		142	PASS	
001V4	MG-DS1		143	PASS	
001V4	MG-DS1		144	PASS	
001V4	MG-DS1		145	PASS	
001V4	MG-DS1		146	PASS	
001V4	MG-DS1		1227	ABORT	1412
001V401	TIE-DS1	0001/001	7	ABORT	1412

Subsystems Maintained by Communication Manager

Communication Manager subsystems are listable using the **list config** command and, in most cases, have some maintenance activities involved.

NOTE:
list config all' on the Communication Manager SAT gives you complete information, including whether or not stations have been administered on a port. **show mg list_config** on the G700 MGP gives you information for the installed equipment in that G700.

G700 Subsystems Maintained by Communication Manager

The G700 subsystems that are applicable to Communication Manager maintenance considerations are identifiable by the presence of 'angels'. Angels may be either physical or virtual, and both types use the CCMS message. Table 61, G700 Subsystems Maintained by Communication Manager, on page 177 lists the applicable subsystems and how they are maintained.

Table 61: G700 Subsystems Maintained by Communication Manager

Subsystem	Angel Maintenance Type
Any Media Module	Physical Angel
Messaging Daughter Board (part of the S8300)	Virtual Angel
Announcement Circuitry (part of the MGP)	Virtual Angel

G700 Media Gateway MOs

The following list shows G700 specific maintenance objects. Other maintenance objects have been modified slightly for the G700.

- MED-GTWY (MEDIA GATEWAY)
- MG-ANA (ANALOG MM711)
- MG-ANN (Voice Announcements)
- MG-BRI (BRI Trunk Media Module MM720)
- MG-DCP (Digital Line Media Module)
- MG-DS1 (DS1 Interface Media Module)
- MG-ICC (Internal Call Controller)
- MG-VOIP (MM760 MED PRO DSP PORT)

MO Groupings by MM Type

Table 62, Media Module Tests, on page 177, on page 9 shows MO groupings by Avaya Media Module type.

Table 62: Media Module Tests

Media Module	Maintenance Object
T1/E1 Media Module (MM710)	Board (MG-DS1)
	DS1 CO Trunk (CO-DS1)
	DS1 DID Trunk (DID-DS1)
	DS1 Tie Trunk (TIE-DS1)
	DS1 ISDN Trunk (ISDN-TRK)
	ISDN-PRI Signaling Link Port (ISDN-LNK)
	ISDN-PRI Signaling Group (ISDN-SGRP)
	Wideband Access Endpoint Port (WAE-PORT)

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Table 62: Media Module Tests

Media Module	Maintenance Object
Analog Media Module (MM711)	Board (MG-ANA)
	Analog Line (AN-LN-PT)
	Analog Co Trunk (CO-TRK)
	Analog DID Trunk (DID-TRK)
	DIOD Trunk (DIOD-TRK)
	Alarm Port (ALARM-PT)
DCP Media Module (MM712)	Board (MG-DCP)
	Digital Line (DIG-LINE)
BRI Trunk Media Module (MM720)	Board (MG-BRI)
	ISDN Trunk Side BRI Port (TBRI-PT)
	ISDN Trunk Side Signaling (TBRI-TRK)
VOIP Media Module (MM760)	Board (MG-VOIP)
Voice Announcements (Communication Manager)	Board (MG-ANN)
	Announcement Ports (VAL-PT)
	Ethernet Port (ETH-PT)

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Viewing Communication Manager Alarms

The technician views Communication Manager alarms and events through commands, shown in Table 63, Commands for Viewing Communication Manager Alarms, on page 179, that are available via the Web Interface or the SAT command-line interface.

Table 63: Commands for Viewing Communication Manager Alarms

Command	Interface	Purpose	Description
View Current Alarms	Web Interface, under Alarms and Notification	To view a list of outstanding alarms against Communication Manager	Displays a summary of alarms (if present), followed by a detailed table of explanation.
display alarms	SAT CLI	To view logged Communication Manager alarms	These are the alarms that have not yet been cleared, either manually or via an Expert System.

Command Syntax

Maintenence commands use a different command syntax depending upon whether they refer to port network circuit packs or media gateway Media Modules. The command syntax is the following:

test port UUCSSpp for circuit packs

where,

Variable	Definition	Platform	Range
UU	Universal cabinet number	ATM PNC	1-64
		CSS PNC	1-44
		G600	1-64
C	Carrier designation	ATM PNC	A, B, C, D, or E
		CSS PNC	A, B, C, D, or E
		G600	A, B, C, or D
SS	Circuit pack slot	ATM PNC	01-21
		CSS PNC	01-21
		G600	01-10
pp	2-digit port number	All	01, 02,...

and

test port GGGVSpp for media modules,

where,

Variable	Definition	Platform	Range
GGG	Media gateway number	G700	1-250
		G350	1-250
V	Literal: designates media gateway	All	N/A
S	Media module number	G700	1-9
		G350	1-250
pp	2-digit port number	All	01, 02,...

Full test commands can be either short or long, and can be repeated several times. For example, in:

test port UUCSSpp sh r 1

sh = short

r = repeat

1 = the number of times the test should be repeated.

Similarly, in:

test port GGGVSpp l r 2

l = long

r = repeat

2 = the number of times the test should be repeated.

Abort Code 1412

Tests that do not run on the G700 will abort with Abort Code 1412. Tests that abort are listed under each MO, but are not described.

Escalation Procedure

This document is not intended to solve all levels of trouble. When the limits of these procedures have been reached but a problem is not resolved, a technician should escalate to a higher level of technical support.

This escalation should conform to the procedures in the *Technical and Administration Plan*.

Frequently, a repair procedure recommends repeating a test several times after waiting short time intervals, for example, at one minute intervals up to five times. If after these repetitions, no response to the test has occurred, or if the same Abort or Failure has occurred repeatedly, it is understood that a technician should escalate to a higher level of technical support.

ABRI-PORT (ASAI ISDN-BRI Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ABRI-PORT [1]	MAJOR MINOR WARNING	**test port *location* l** [2]	ASAI ISDN-BRI port

1 The alarm level for ABRI ports may be administered using the **set options** command. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ABRI port in the system.

2 For information on specifying a location, see Command Syntax on page 179.

For repair procedures, see BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port) on page 499.

AC-POWER

S8700 / S8500

AC Power for AC-Powered Systems

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
AC-POWER	WARNING	**test environment *UU*** [1]	AC Power

1 ***UU*** is the universal cabinet number indicated in the PORT field of the alarm log.

S8700 Multi-Connect systems support two different cabinet types as PNs: multicarrier cabinets and single-carrier cabinets. Both types may be powered by either an AC or DC power source. Environmental maintenance differs according to a cabinet's type and its power supply.

CAUTION:
Before powering down a cabinet or carrier that contains EMBEDDED AUDIX circuit packs (TN566), first power down the AUDIX unit to avoid damaging its software. Instructions for powering down this unit are in *EMBEDDED AUDIX System Maintenance, 585-300-110 for the circuit pack, and in Avaya™ S8300 and Avaya™ S8700 Media Server Library, 555-233-825*.

Power System for Single-Carrier Cabinet

Each single-carrier cabinet has one power supply that distributes DC power and AC ringing voltage to the circuit pack slots in the cabinet.

AC Power Supply (WP-91153)

In an AC-powered cabinet, a single, plug-in, multi-output AC power supply is in the power supply slot. A power cord, with a 3-prong plug on one end and an appliance connector on the other end, connects the supply to a dedicated AC power source. The inputs to the power supply can be (depending on list version):

- 120 VAC, 60 Hz, 15 to 20 Amp; three wires in the power cord (one hot, one neutral, and one ground wire)
- 220 VAC or 240 VAC, 50 Hz, 10 Amp; three wires in the power cord (one hot, one neutral, and one ground wire)

The AC power supply produces the following DC outputs: +5 VDC, -5 VDC, -48 VDC, +12 VDC, and a battery-charging voltage. The DC outputs distribute power on the cabinet backplane to the circuit pack slots.

The AC power supply also produces AC ringing voltage. The AC ringing voltage output value and frequency depend on the country of use. The power supply has a circuit breaker and EMI filtering.

Nominal Power Holdover

Multicarrier Cabinets

Two types of battery holdover are available:

- The small battery assembly provides short-term battery holdover. If AC power fails, 48 VDC batteries power the system for:
  - — 15 seconds in a PN cabinet
  - — 10 minutes in the expansion control carrier in the "A" position of a PN cabinet
- Some AC-powered multicarrier cabinets (MCCs) contain three 48-Volt batteries and a battery charger (397C) to provide backup power in case power is interrupted. The holdover times are identical to those above.

Single-Carrier Cabinets

A holdover circuit in the power supply allows a system to operate normally during AC power interruptions. When AC input power fails, reserve batteries supply power to the memory and processor circuit packs and fans for two minutes. Every port circuit pack is inactive during this time. The power supply contains a battery charger to charge the holdover batteries.

Error Log Entries and Test to Clear Values

Table 64: AC Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test environment** *UU* **sh r 1**
513	Any	AC Power Query test (#78)	WARNING	OFF	**test environment** *UU* **sh r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order shown in the table below. For example, by clearing error codes associated with the Battery and Battery Charger Query test (#5), you may also clear errors from other tests in the testing sequence. Refer to the appropriate sections of this chapter for descriptions of each test.

NOTE:
The following tests apply to J58890CE, J58890CF, and J58890CH.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query test (#5)	X	X	ND
AC Power Query test (#78)	X	X	ND
Power Unit Query test (carrier E) (#127)	X	X	ND
Power Unit Query test (carrier D) (#127)	X	X	ND
Power Unit Query test (carrier A) (#127)	X	X	ND
Power Unit Query test (carrier B) (#127)	X	X	ND
Power Unit Query test (carrier C) (#127)	X	X	ND
Emergency Transfer Query test (#124)	X	X	ND
Cabinet Temperature Query test (#122)	X	X	ND
External Alarm Lead Query test (#120)	X	X	ND
Analog Ring Generator Initialization test (#117)	X	X	ND
Analog Ring Generator Query test (#118)	X	X	ND

1 D = Destructive; ND = Nondestructive

AC Power Query Test (#78)

This test queries either the server's watchdog (via an Ethernet or USB interface) or an MCC PN's Maintenance circuit pack for status of the cabinet's AC power.

Table 65: Test #78 Power Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
100, 2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to ABORT with error code 2000, check for system powering problems with the PN's A carrier. Resolve every AC-POWER and CARR-POW (**S8700 IP**: RMC-ENV) alarm. Then, repeat the test. **3** If the test still ABORTs with error code 2000, check for and resolve every MAINT (Maintenance circuit pack) error in a PN. Then, repeat the test. **4** If the test still ABORTs with error code 2000, escalate the problem.
2029, 2319, 2320, 2500	ABORT	Internal system error

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Table 65: Test #78 Power Query Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The cabinet is currently without AC power. **NOTE:** For a J58890CE, skip to Procedures for a J58890CE:. **Procedures for a Global MCC (J58890CH):** **1** For a nominal holdover system if there is no AC power at the wall outlet, have a qualified electrician restore power to the outlet. Power should range from 170 to 264 VAC. **2** If there is AC power at the wall outlet, then there could be a problem with the RM0850 rectifiers, BU3200A BIU (battery interface unit), or battery. Resolve every alarm logged against the POWER MO, and rerun the test. If the test still fails, the BIU may be defective. Check the BIU. If the BOD alarm LED is on, replace the BIU. For **S8700 MC**, if the BOD LED is off and the BOK LED is on, then a PN's Maintenance circuit pack may be incorrectly reporting the problem. Resolve every alarm against these MOs, and rerun the test.
1 (cont'd)	FAIL	**Procedures for a J58890CE:** **1** Check for AC power at the wall outlet (99–127 or 200–250 VAC). **2** If AC power is absent, then the problem is not with the system itself. Power must be restored to the wall outlet. If present, there could be a problem with the battery or battery chargers. Resolve every alarm logged against POWER (battery & battery charger), and rerun the test. **3** If the test still fails, then fuse F5 may have opened. Replace this fuse, and rerun the test. **WARNING:** Turn off the 397C Battery Charger before inserting or removing Fuse F5. **4** If the test still fails, then the server's watchdog or a PN's Maintenance circuit pack may be incorrectly reporting the problem. Resolve every alarm against these MOs, and rerun the test. Some watchdog and Maintenance circuit-pack errors *may not* be detected by their respective maintenance routines, but can cause many environment tests to fail. **5** If more than two environment tests are failing, replace the suspected circuit pack (depending on the system configuration), and rerun the test.
100	FAIL	The cabinet is currently without AC power, and AC power maintenance is in the middle of timing the NPH interval. **1** Follow the repair steps for error code 1.
	PASS	The server's watchdog or the PN's Maintenance circuit pack has reported that the cabinet has AC power.

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AC-POWER for DC-Powered Systems

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
AC-POWER	WARNING	**test environment** ***location***[1]	AC Power

1 For information on specifying a location, see Command Syntax on page 179.

NOTE:
In a DC-powered multicarrier cabinet, the AC-POWER MO exists, but serves no functional purpose. Because the system cannot determine the type of power used, the AC-POWER test should always pass or abort. The maintenance strategy for power components in DC cabinets is described in CARR-POW (Carrier Power Supply) on page 578.

S8700 MC: S8700 Multi-Connect supports three different cabinet types for PNs: multicarrier cabinets (MCCs), single-carrier cabinets (SCCs), and 19-inch rack mounted cabinets. Every type may be powered by either an AC or DC power source. Environmental maintenance differs according to a cabinet's type and its power supply.

S8700 IP: S8700 IP Connect supports 19-inch rack mounted cabinets that may be powered by either an AC or DC power source.

Error Log Entries and Test to Clear Values

Table 66: AC Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test environment** *UU* **sh r 1**
513	Any	AC Power Query test (#78)	WARNING	OFF	**test environment** *UU* **sh r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. For example, by clearing error codes associated with the AC Power Query test (#78), you may also clear errors generated from other tests in the testing sequence. Refer to the appropriate sections of this chapter for descriptions of each test.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query test (#5)	X	X	ND
AC Power Query test (#78)	X	X	ND
Power Unit Query test (carrier E) (#127)	X	X	ND
Power Unit Query test (carrier D) (#127)	X	X	ND
Power Unit Query test (carrier A) (#127)	X	X	ND
Power Unit Query test (carrier B) (#127)	X	X	ND
Power Unit Query test (carrier C) (#127)	X	X	ND
Emergency Transfer Query test (#124)	X	X	ND
Cabinet Temperature Query test (#122)	X	X	ND
External Alarm Lead Query test (#120)	X	X	ND
Analog Ring Generator Initialization test (#117)	X	X	ND
Analog Ring Generator Query test (#118)	X	X	ND

1 D = Destructive; ND = Nondestructive

AC Power Query Test (#78)

This test is not valid for DC-powered cabinets and should always abort or pass (**S8700 IP**: will always abort).

Table 67: Test #78 Power Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run test are not available.
100, 2000	ABORT	Response to the test request was not received within the allowable time period.
2029, 2319, 2320, 2500	ABORT	Internal system error. **S8700 MC**: **1** Retry the command at 1-minute intervals up to 5 times.

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Table 67: Test #78 Power Query Test

Error Code	Test Result	Description / Recommendation
S8700 MC: Any	FAIL	A PN's Maintenance circuit pack is incorrectly reporting an AC power problem. If this test fails, there is a problem with a Maintenance circuit pack. Replace the suspected circuit pack, and run the test again.
S8700 MC	PASS	Since this test is invalid for DC-powered cabinets, this result simply indicates that a PN's Maintenance circuit pack is handling this test properly.

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ADJ-IP/ASAI-IP (ASAI Adjunct IP Link)

S8100 only

ADJ-IP and ASAI-IP are the two CTI link types supported by the coresident DEFINITY LAN Gateway (DLG) feature.

The ASAI-IP link (asai-ip) is the Adjunct Switch Application Interface (ASAI) link between the S8100 and an ASAI adjunct. The Adjunct IP link (adj-ip) is the ASAI proprietary link between the S8100 and CentreVu-CT. The ASAI endpoint is connected to an Ethernet LAN.

MO name (in alarm log)	Alarm level	Initial command to run	Full name of MO
ADJ-IP	MAJOR[1]	**test cti-link *n***[2]	Adjunct IP link
ASAI-IP	MAJOR	**test cti-link *n***	ASAI IP link

1 The alarm level may be downgraded using the off-board Adjunct Link entry on the Set Options form

2 *n* is the CTI link number (1–8). This number appears as the port number in the error and alarm logs

To use the ASAI-IP and ADJ-IP link types, the license file must turn on the following features: "Co-Res DEFINITY LAN Gateway" *and* "ASAI Link Core Capabilities" (for ASAI-IP links) and/or "Computer Telephony Adjunct Links" (for ADJ-IP links). These settings can be checked by displaying the System-Parameters Customer-Options form. In addition, the links must be administered on the DLG Administration page of the IP Services form.

The ADJ-IP link is an Avaya proprietary link that enables the complete set of ASAI link capabilities. This link is used for CentreVu CT.

The ASAI-IP link supports three levels of ASAI link capabilities, depending on the RTUs purchased. If this link type is enabled in the license file, the ASAI Link Core Capabilities? is set to **y** on the System-Parameters Customer-Options form. If the second level of capabilities is enabled, the ASAI Link Plus Capabilities? is also set to **y**. A third level of capabilities can be enabled with per-RTU purchases, indicated on the ASAI Enhanced Features page of the System-Parameters Customer-Options form. This link is used for ASAI adjuncts, including CentreVu CT.

On the S8100, the LAN interface is provided by the Ethernet interface on the TN2314 circuit pack and/or by the C-LAN (Control LAN) TN799 circuit pack.

Error log entries and test to clear values

Table 68: ADJ-IP/ASAI-IP error log entries

Error type	Aux data	Associated test	Alarm level	On/Off board	Test to clear value
0[1]		Any	Any	Any	test cti-link 1
2 (a)	2-102	ASAI Link Status Test (#1365)	None		test cti-link 1

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Table 68: ADJ-IP/ASAI-IP error log entries

Error type	Aux data	Associated test	Alarm level	On/Off board	Test to clear value
18 (b)	0	None	WARNING	OFF	release cti-link 1
257 (c)		ASAI Link Status Test (#1365)	MAJOR[2]	OFF	test cti-link 1
513 (d)		ASAI Link Status Test (#1365)	WARNING	OFF	test cti-link 1
769 (e)		ASAI Heartbeat Test (#1366)	MAJOR	OFF	test cti-link 1 long
1025 (f)		ASAI Link Status Test (#1365)	MAJOR	OFF	test cti-link 1
2561-2568 (g)		None	None		
3329 (h)		ASAI Link Status Test (#1365)	MAJOR	OFF	test cti-link 1
3584-3839 (i)		None	None		
3840 - 4095 (j)		None	None		

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1 Run the Short Test sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 The alarm level for ASAI adjuncts may be administered using the **set options** command for Off-board Adjunct Link Alarms. The alarm level can be set to MAJOR, MINOR, or WARNING for all ASAI adjuncts in the system.

Notes:

a Error Type: 2 - Errors of this type indicate violations of the ISDN-BRI signaling protocol. Timers associated with certain Layer 3 messages have expired before a required response was received. In the following table, the aux data column indicates which timer has just expired. For more information, refer to the Avaya ISDN-BRI Specification.

Aux data	Timer type
2	First T303 (SETUP timer)
3	Second T303 (SETUP timer)
4	T305 (DISConnect timer)
5	First T308 (RELease timer)
6	Second T308 (RELease timer)
10	T316 (RESTart timer)
12	T309 (Layer 2 Failure timer)
16	TM100 (Management Information Message timer 1)
17	TM200 (Management Information Message timer 2)
102	TASAI (ASAI Routing Timer)

b Error Type: 18 - The cti-link has been busied out.

c Error Type: 257 - The ASAI link is not in an “established” state.

d Error Type: 513 - The ASAI link is hyperactive.

e Error Type 769 - No response from the far end to a heartbeat request.

f Error Type: 1025: TCP Tunnel Protocol Connection Failure.

g Error Type: 2561-2568: ASAI Application Message Discard.

h Error Type: 3329 - The TCP tunnel connection is not in an “established” state.

i Error Types: 3584 -3839. Certain ASAI protocol-specific cause codes are logged by switch software. The cause code can be determined for the following formula:

If the error type is greater than 3712, then the ASAI cause code is equal to the error type minus 3712. This code was sent to the adjunct by the switch.

If the error type is less than 3712, then the ASAI cause code is equal to the error type minus 3584. This code was sent to the switch by the adjunct.

A description of the various ASAI cause values is contained in Table 69, ASAI cause values, on page 193. The table shows the actual error log value (3584-3839), rather than the ASAI cause code value. This table also contains recommended craft actions associated with the cause value. Further information can also be found in the AT&T ASAI Specification (AT&T PUB 288-500-03). In addition, the Aux Data field of the Error Log entry contains additional diagnostic information.

j Error Types: 3840 - 4095. Certain ISDN cause codes are logged by switch software. The cause code can be determined for the following formula:

If the error type is greater than 3968, then the ISDN cause code is equal to the error type minus 3968. This code was sent to the switch by the adjunct.

If the error type is less than 3968, then the ISDN cause code is equal to the error type minus 3840. This code was sent to the adjunct by the switch.

A description of the various ISDN cause values is contained in Table 70, ISDN cause values, on page 194. This table also contains recommended craft actions associated with the cause value.

Table 69: ASAI cause values

Error log entry	ASAI code	Explanation	Recommendation
3584, 3712	0	(Service or Option Not Available) Unrecognized ASAI protocol operation	The requested ASAI protocol operation is not implemented by the switch or adjuncts. The Aux Data Field or Error Log entry contains the protocol identifier for the unrecognized operation. **1** Consult switch and adjunct documentation to determine which set of operations is supported by the switch and the adjunct. Adjunct administration turning off operations not implemented by the switch may resolve the problem. **2** If step 1 does not resolve the problem, escalate to the next tier. There are no available internal resources to service switch or adjunct request. System transaction capacity for the adjunct or switch is exceeded.
3624, 3752	40	(Service or Option Not Available) Resources not available	**1** See recommendation above for ASAI code 0. **2** Re-engineering of adjunct services may be required. If the problem persists, escalate the problem to the next tier.
3647, 3775	63	(Service or Option Not Available)	The requested ASAI capability or resource is not available on the switch or adjunct. More than one adjunct may be contending for the same switch resources. There is a potential administration mismatch between the resource domains administered on the switch and those administered on the adjunct. **1** Verify that no overlapping administration of switch resources (for example, requesting notification on a single domain by multiple adjuncts or multiple adjuncts attempting to control a single call) exists across all adjuncts connected to the switch. If overlaps exists, then readminister the adjuncts to guarantee that each adjunct is associated with a unique set of switch resources. **2** If step 1 does not resolve the problem, escalate to the next tier.

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Table 69: ASAI cause values

Error log entry	ASAI code	Explanation	Recommendation
3663, 3791	79	(Service or Option Not Implemented)	A requested service or option (or combination of selected options) is not supported (implemented) in the switch or the adjuncts. **1** Consult the switch and adjuncts documentation to determine ASAI service options supported by both the switch and the adjuncts. Readministration of the switch-administered capabilities (see Customer Optional Features form) or those of the adjunct may be necessary to correct the problem. **2** If step 1 does not provide the set of desired services due to deficient implementation, escalate the problem to the next tier.
3671, 3799	87	(Switch Error Conditions) Internal switch audit	There is an inconsistency in switch data records. **1** No action is needed since the switch has corrected the data inconsistency. **2** If a number of these errors continue to occur, then escalate to the next tier.

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Table 70: ISDN cause values

ISDN Cause codes

Error log entry	ISDN code	Explanation	Recommendation
3874, 4002	34	Switch resources not available No circuit or channel available	There are no available trunks for outgoing call requests: **1** Verify that the adjunct is administered to support the trunk capabilities of the switch. **2** Investigate trunk group status by issuing status trunk commands from the SAT, or by requesting a trunk group query or queries from the adjunct. **3** Perform trunk diagnostic procedures outline in this manual.

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Table 70: ISDN cause values

ISDN Cause codes

Error log entry	ISDN code	Explanation	Recommendation
3890, 4018	50	Requested facility not subscribed	Requested facility is implemented, but not administered. Potential administration problem with endpoint or adjunct. **1** Display the Customer Optional Features form on the switch to determine which ASAI or Adjunct link capabilities are turned on in the switch. **2** Verify that the adjunct is administered to support the identical capabilities as the switch. If there is a mismatch in the administration capabilities, then readminister the switch and/or the adjunct to match.
3921, 4049	81	Adjunct switch error conditions Invalid CRV	An invalid CRV was sent by the adjunct. **1** This may indicate a CRV inconsistency between the switch and the adjunct. See the CallVisor protocol reference manual.

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System technician-demanded tests: descriptions and error codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the ASAI Link Status Test (#1365) on page 195, for example, you may also clear errors generated from other tests in the testing sequence.

Table 71: CTI link system technician-demanded tests

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
ASAI Link Status Test (#1365)	X	X	ND
TCP Tunnel Connection Heartbeat Test (#1366)		X	ND

1 D = Destructive; ND = Nondestructive

ASAI Link Status Test (#1365)

This test is nondestructive.

This test queries the Call Processing software for the state of the TCP Tunnel Connection. If the Tunnel Connection is in the “established” state and if the ASAI link is in the “established” state, the test returns with a PASS. Otherwise, the test fails.

Table 72: TEST #1365 ASAI Link Status Test

Error Code	Test Result	Description/ Recommendation
1189	ABORT	The DLG service is not enabled. **1** Enable the asai service administered for this link on the *ip-services* form. **2** If the test continues to abort, escalate the problem.
2500	ABORT	Internal System Error **1** Retry the command at 1-minute intervals a maximum of 3 times. **2** If the test continues to abort, escalate the problem.
[1]	FAIL	The test failed because the ASAI Adjunct link is not up. The state of the link is represented by the error code as presented in Table 71, CTI link system technician-demanded tests, on page 195. **1** Check the link status by entering the **status dlg cti-link** command. **2** If the TCP Tunnel Connection is not established: **cb** Check the entry for the local node on the **ip-services** form. If the entry is **clan***X*, where X is the board number, refer to the maintenance information for the C-LAN board (CLAN-BD (Control LAN Circuit Pack) on page 599) to clear the problem. If the entry is **procr**, refer to the maintenance information for the Processor LAN interface to clear the problem. **cc** If the test continues to fail, escalate the problem. **3** If the ASAI link is not established but the Connection is established: **cd** Use the ping command with the IP address for the remote node. This IP address is the IP-Address specified on the Node Names form for the Remote Node specified on the **ip-services** form. If no response is received, follow the repair procedures above for TCP Tunnel Connection Not Established. **ce** Use the administration information for the *G3 PBX Configuration* screen on CentreVu-CT to verify that the ASAI service is administered correctly.
	PASS	The ASAI link is up. That is, the Tunnel Connection is “established” and the ASAI Link state is “established”.

1 Refer to Table 73, Error Codes for Link Status Test Failures, on page 197.

Table 73: Error Codes for Link Status Test Failures

Error Code	Link Status		
	Connection State Not Established?	Link Hyperactive?	ASAI Link Not Established?
0			
1			X
2		X	
3		X	X
4	X		
5	X		X
6	X	X	
7	X	X	X

TCP Tunnel Connection Heartbeat Test (#1366)

This test is nondestructive.

This test requests that a TCP Tunnel protocol heartbeat message be sent to the far end. It then checks for a response every 2 seconds for a maximum of 20 seconds. The test fails if a response has not been received within 20 seconds.

Table 74: TEST #1399 TCP Tunnel Connection Heartbeat Test

Error Code	Test Result	Description/ Recommendation
1189	ABORT	The DLG service is not enabled. **1** Enable the asai service administered for this link on the *ip-services* form. **2** If the test continues to abort, escalate the problem.
1190	ABORT	The DLG service has not established the TCP Tunnel. **1** Check that the ASAI software in the CentreVu CT processor is running. **2** If the test continues to abort, escalate the problem.
2500	ABORT	Internal System Error **1** Retry the command at 1-minute intervals a maximum of 3 times. **2** If the test continues to abort, escalate the problem

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Table 74: TEST #1399 TCP Tunnel Connection Heartbeat Test

Error Code	Test Result	Description/ Recommendation
	FAIL	The test failed since a response to the heartbeat message was not received within 20 seconds **1** Check the link status by entering the **status dlg cti-link** command. **cf** Follow the repair procedures described for the failure of Test #1365 - ASAI Link Status.
	PASS	A response to the heartbeat message was received.

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ADM-CONN (Administered Connection)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ADM-CONN	MAJOR, MINOR, or WARNING	**status administered-connection *N*** [1]	Administered Connection

1 Where ***N*** is an administered connection number indicated in the PORT field of the Alarm or Error Log.

An administered connection provides an end-to-end connection between two access endpoints or data modules residing in either the same switch or different switches. When administered, the connection is automatically established and scheduled to be permanently active.

An error is logged whenever an administered connection fails or cannot be established. Failures to establish a connection generate an error whether they occur on an initial try, a retry, a fast retry, a redial or an auto-restoration. A failed connection generates an error whether or not the connection is subsequently reestablished by fast retry, redial, or auto restoration.

An alarm is logged when an administered connection cannot be established either initially or after a connection failure. Both the alarm level (none to major) and a failure threshold can be administered for each administered connection. An alarm is raised when either of the following occurs:

- The number of consecutive failed attempts to establish a connection reaches the administered threshold.
- Software determines that failure to establish a connection is due to a mistake in administration. See Table 75, Administered Connection Error Log Entries, on page 199.

Error Log Entries and Test to Clear Values

Table 75: Administered Connection Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0, or 29	Any	None	Any	OFF	None
1, or 28 (a, b)	Any	None	Any	OFF	None
2 (c)	Any	None	Any	OFF	None
6, 21, 31, or 127(d)	Any	None	Any	OFF	None
16 (a)	Any	None	Any	OFF	None
17 (e)	Any	None	Any	OFF	None
18, or 102 (f)	Any	None	Any	OFF	None
22 (a, g)	Any	None	Any	OFF	None
34, 42, 44, or 58 (h)	Any	None	Any	OFF	None

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Table 75: Administered Connection Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
38, or 41 (i)	Any	None	Any	OFF	None
43, or 81	Any	None	Any	OFF	None
50 (a)	Any	None	Any	OFF	None
52 (a)	Any	None	Any	OFF	None
54	Any	None	Any	OFF	None
65,66, or 69 (a)	Any	None	Any	OFF	None
82	Any	None	Any	OFF	None
88 (a)	Any	None	Any	OFF	None
91, 95, 96, 97, 98, 99, 100, or 111	Any	None	Any	OFF	None

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For ADM-CONN Errors

None of the above errors have a specific associated test and, except for errors 17 and 127, are valid only for administered connections established over ISDN-PRI facilities. Error 127 is valid for administered connections established over non-ISDN facilities or between two endpoints on the same switch.

Notes:

a These errors are typically associated with administration problems and are not expected to be temporary. The administered connection is not retried and the failure is alarmed immediately. The alarm threshold specified by the customer is ignored.

b The address of the destination endpoint is: an unassigned number (1), has an invalid number format (28), or is restricted from terminating calls due to Class of Restriction ("Access Denied"). Verify that the destination address is correct and that the destination endpoint is administered. The destination endpoint is not administered on the switch where this error is logged.

c A request has been made to use a transit network or common carrier that cannot be accessed. Check the routing pattern used by this administered connection and verify that the inter-exchange carrier specified is correct.

d The exact failure cause is unknown or has been mapped to one of these values. If this is a permanent condition, try reversing the direction of the Administered Connection (originate the administered connection from the destination switch). This may yield another failure cause.

e The destination endpoint is not available. Check the status of the destination endpoint at the far-end switch. The status for the destination endpoint will not be available on the switch where this error is logged. At the far end, use **status access-endpoint** or **status data-module** to see whether the endpoint is busy, out-of-service or otherwise unavailable.

f This switch sent an ISDN message to another switch that either did not respond (18) or did not respond within the allotted time (102). This could be due to link failure, or congestion, or an outage at the other switch.

g The address of the destination endpoint has changed. Change the administered connection accordingly. The destination endpoint will not be administered on the switch where this error is logged.

h These errors indicate that a resource (for example, a circuit or bearer capability) required by the administered connection is not currently available.

i A network failure (38) or temporary failure (41) has occurred. Error Log entries for other MOs (for example, DS1-BD) may indicate a local problem.

ADX8D-BD (AUDIX Circuit Pack)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ADX8D-BD	MINOR or WARNING	**test board *location* sh**	AUDIX circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

The ADX8D-BD MO represents a TN566/TN2169 EMBEDDED AUDIX circuit pack (also called DEFINITY AUDIX) operating in DP (digital-port) mode. For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. Port-level problems are covered by ADX8D-PT.

EMBEDDED AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests described in this manual apply only to switch-side maintenance which tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *EMBEDDED AUDIX System Maintenance, 585-300-110*.

ADX8D-PT (AUDIX Digital Port)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ADX8D-PT	MINOR	**test port *location* l**	AUDIX digital port
ADX8D-PT	WARNING	**test port *location* sh**	AUDIX digital port

1 For information on specifying a location, see Command Syntax on page 179.

The ADX8D-PT MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack (also called DEFINITY AUDIX) operating in DP (digital-port) mode. The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADX16A-PT.

The tests described in this section apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *EMBEDDED AUDIX System Maintenance, 585-300-110*.

AUDIX resides on a combined pair of circuit packs: the TN566 MFB (multifunction board) and the TN2169 ALB (alarm board). Because of its size, this combination occupies 5 slots, but only 1 slot is functional as far as the switch is concerned. The other 4 slots are seen by the switch as "AUDIX-reserved" slots (or ADXDP-RS/ADX8D-RS).

In DP mode the TN566 pack supports up to 8 voice ports, each with a primary and a secondary information channel. Ports are administered in increments of two. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

Unlike other AUDIX systems, EMBEDDED AUDIX is not an adjunct.

CAUTION:
Never do any of the following without first shutting down AUDIX. Follow instructions on the TN566/TN2169 faceplate:

- *Remove EMBEDDED AUDIX circuit packs*
- *Cycle power to a carrier containing EMBEDDED AUDIX circuit packs*
- *Remove power to a carrier containing EMBEDDED AUDIX circuit packs*

Error Log Entries and Test to Clear Values

Table 76: EMBEDDED AUDIX Digital Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	40987	None	WARNING	OFF	
1 (b)	1 to 20	None	WARNING	OFF	
15 (c)	Any	None			
18 (d)	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
23 (e)	0	None	WARNING	OFF	
130 (f)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257 (g)	40971	None			
513 (h)	Any	None			
1537 (i)	40968	None	WARNING	OFF	
1793		Voice & Ctrl. Local Loop test (#13)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 3**
2049		NPE Crosstalk test (#9)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 3**
2305 (j)	40967	None			
3840 (k)	40965	None			
3840 (l)	41029	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a Error Type 1: The user may experience a noisy port or link, due to an off-board problem that is detected by the port circuit. If so, replace the circuit pack (see caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a predetermined time.

b Error Type 1: At least 15 off-board problems have been detected with the link to the voice port. When an error with the link is detected, an on-board counter is incremented. Also see Note (a).

c Error Type 15: This is an internal type error that occurs when an audit request fails.

d Error Type 18: The port is busied-out by command. Use **release port *UUCSSpp*** to release the port.

e Error Type 23: The circuit pack is administered but not physically installed. The alarm will clear when a circuit pack is inserted.

f Error Type 130: The circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the AUDIX circuit pack (see Caution at the beginning of this section).

g Error Type 257: Something is interfering with transmission to the voice port. This is usually an on-board problem and can be ignored if there are no user complaints.

h Error Type 513: AUDIX is not available to the switch, possibly due to a busyout on the AUDIX system. Check out the AUDIX system referring to *EMBEDDED AUDIX System Maintenance*, 585-300-110, if necessary.

i Error Type 1537: An in-line maintenance error has generated an off-board warning due to some problem with the link to the voice port. This can be ignored if there are no user complaints. If the problem persists, replace the circuit pack (see Caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a certain period of time.

j Error Type 2305: The link between the circuit pack and the voice port is successfully reset. No craft action is necessary.

k Error Type 3840: No voice ports are connected to the EMBEDDED AUDIX circuit pack. No maintenance action is required.

l Error Type 3840: The message buffer in the circuit pack is full.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when you are inspecting errors in the system. For example, by clearing error codes associated with the Voice and Control Channel Local Looparound test (#13), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Voice and Control Channel Local Looparound test (#13)		X	ND
NPE Crosstalk test (#9)		X	ND

1 D = Destructive; ND = Nondestructive

NO-OP Tests

The maintenance strategy for EMBEDDED AUDIX emulates the one for DIG-LINE. The following tests apply only to DIG-LINE and not to EMBEDDED AUDIX. These are referred to as NO-OP tests, and they always return PASS.

- Electronic Power Feed test (#11)
- Station Lamp Updates test (#16)
- Station (Digital) Audits test (#17)

NPE Crosstalk Test (#9)

This test verifies that this port's NPE channel talks on the selected time slot and that it never crosses over to time slots reserved for other connections. An NPE that is not working correctly may cause 1-way and noisy connections. This test is part of a port's long test sequence, and it executes in about 20 to 30 seconds.

Crosstalk testing is performed on both the primary (for voice) and the secondary (for data) information channel associated with each EMBEDDED AUDIX port. If this test fails on either channel, the voice port is taken out of service.

Table 77: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available. Also, the port may have been busy during the test. **1** Check the port status. **2** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, wait until it is idle. **3** Retry the command at 1-minute intervals up to 5 times.
2	ABORT	System resources may not have been available, or the port may have been busy during the test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be active. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, wait until it is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** Retry the command at 1-minute intervals up to 5 times.

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Table 77: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was put in use during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before testing.
1020	ABORT	Test disabled by background testing. Use **status station** to determine when the voice port is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The NPE of the tested port is transmitting in error. This causes noisy and unreliable connections. Failure code 1 indicates that the Crosstalk test failed on the primary channel. Failure code 2 indicates that the Crosstalk test failed on the secondary channel. **1** Replace the circuit pack.
	PASS	The port is using its allocated time slots correctly. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times to make sure it continues to pass. **2** If complaints still exist, examine the connections.

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Voice and Control Channel Local Loop Test (#13)

This test checks the information and control channels between a server and the EMBEDDED AUDIX port circuit. First, the primary information (voice) channel loop back test is run.

While the primary information channel is still looped around, the Control Channel Looparound test is performed. The Looparound test for the secondary information (data) channel is then performed. This is the same test as the primary information channel's loop-around test.

Next, a Conference test is implemented for the primary information channel. This is the same test as Conference test (#6).

Only one value (Pass, Fail, or Abort) is generated as a result of the four tests run. If any tests fail or abort, the sequence is stopped.

Table 78: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. Then try (b).
1000	ABORT	System resources required to run this test are not available. The port may be active. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, wait until it is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or may have time slots that are out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was put in use during the test. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, wait until it is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
7	FAIL	Conference test failed on the primary channel. Some users may notice a disruption in service. In extreme cases, the conferencing feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port.

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Table 78: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
15	FAIL	The control channel between the processor and the EMBEDDED AUDIX circuit pack is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port.
None	FAIL	The test failed for reasons external to the EMBEDDED AUDIX circuit pack. **1** Run circuit tests to check the Tone Generator circuit and the Tone Detector circuit by using the **test board *location* s** command. **2** Resolve any problems that are detected on the Tone Generator circuit or Tone Detector circuit. **3** If both circuit packs are functioning properly and the test still fails, replace the EMBEDDED AUDIX circuit pack (see caution at the beginning of this section).
	PASS	Voice and Control Channel Local Loop test passed. Every channel is transmitting properly. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times, and see whether it continues to pass. **2** If complaints still exist, examine the connections.

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ADX16D-B (16-Port AUDIX Circuit Pack)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ADX16D-B	MINOR	**test board *location* sh**	AUDIX circuit pack
ADX16D-B	WARNING	**test board *location* sh**	AUDIX circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

The ADX16D-BD MO represents a TN566/TN2169 EMBEDDED AUDIX circuit pack combination operating in 16-port mode digital (DP). For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. Port-level maintenance is covered by ADX16D-PT.

EMBEDDED AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests described in this manual apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy of its own that is described in *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110*.

ADX16A-BD (AUDIX Circuit Pack)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ADXCL-BD or ADX16A-BD	MINOR, or WARNING	**test board *location* sh**	AUDIX circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

The ADX16A-BD MO represents a TN566/TN2169 EMBEDDED AUDIX circuit pack combination operating in control-link (CL) mode. For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. Port-level maintenance is covered by ADX16A-PT.

EMBEDDED AUDIX consists of two circuit packs that occupy 5 slots on a port carrier. The tests described in this manual apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *EMBEDDED AUDIX System Maintenance, 585-300-110*.

ADX16D-P (16-Port AUDIX Digital Port)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ADX16D-P	MINOR or WARNING	**test port *location* l**	AUDIX Digital port

1 For information on specifying a location, see Command Syntax on page 179.

CAUTION:
Never do any of the following without first shutting down AUDIX. Follow the instructions on the TN566/TN2169 faceplate:

- *Remove EMBEDDED AUDIX circuit packs*
- *Cycle power to a carrier containing EMBEDDED AUDIX circuit packs*
- *Remove power to a carrier or cabinet containing EMBEDDED AUDIX circuit pack*

The ADX16D-P MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack operating in digital-port (DP) mode. The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADX16A-PT.

The tests described in this section apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110*.

AUDIX resides on a combined pair of circuit packs: the TN566 Multifunction board (MFB) and the TN2169 Alarm board (ALB). Because of its size this combination occupies 5 slots, but the system sees only 1 slot as functional. The other 4 slots are seen by the switch as "AUDIX-reserved" slots (or ADX16-RES/ADX16D-RS).

In 16-port DP mode, the TN566 pack supports up to 16 voice ports, each with a primary and a secondary information channel. Ports are administered in increments of two. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

Unlike other AUDIX systems, EMBEDDED AUDIX is not an adjunct.

Error Log Entries and Test to Clear Values

Table 79: EMBEDDED AUDIX Digital Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1(a)	40987	None	WARNING	OFF	
1(b)	1 to 20	None	WARNING	OFF	
15(c)	Any	None			
18(d)	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
23(e)	0	None	WARNING	OFF	
130(f)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257(g)	40971	None			
513(h)	Any	None			
1537(i)	40968	None	WARNING	OFF	
1793		Voice and Control Local Loop Test (#13)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 3**
2049		NPE Crosstalk test (#9)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 3**
2305(jj	40967	None			
3840(k)	40965	None			
3840(l)	41029	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow the recommended procedures.

2 Minor alarms may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a Error Type 1: The user may experience a noisy port or link, due to an off-board problem that is detected by the port circuit. If so, replace the circuit pack (see caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a predetermined time.

b Error Type 1: At least 15 off-board problems have been detected with the link to the voice port. When an error with the link is detected, an on-board counter is incremented. Also see Note a, above.

c Error Type 15: An internal type error that occurs when an audit request fails.

d Error Type 18: The port is busied-out by command. Release the port with **release port *UUCSSpp***.

e Error Type The circuit pack is administered but not physically installed. The alarm will clear when a circuit pack is inserted.

f Error Type The circuit pack has been removed or has been insane for more than 21-minutes. To clear the error, reseat or replace the AUDIX circuit pack (see caution at the beginning of this section).

g Error Type 257: Something is interfering with transmission to the voice port. This is usually an on-board problem and can be ignored if there are no user complaints.

h Error Type 513: AUDIX is not available to the switch, possibly due to a busyout on the AUDIX system. Refer to *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110,* if necessary.

i Error Type 1537: An in-line maintenance error has generated an off-board warning due to some problem with the link to the voice port. This can be ignored if there are no user complaints. If the problem persists, replace the circuit pack (see caution at the beginning of this section). Once the problem is resolved, the alarm is retired after a certain period of time.

j Error Type 2305: The link between the circuit pack and the voice port is successfully reset. No craft action is necessary.

k Error Type 3840: No voice ports are connected to the EMBEDDED AUDIX circuit pack. No maintenance action is required.

l Error Type 3840: The message buffer in the circuit pack is full.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. For example, by clearing error codes associated with the *Voice and Control Channel Local Looparound* test (#13), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Voice and Control Channel Local Looparound test (#13)		X	ND
NPE Crosstalk test (#9)		X	ND

1 D = Destructive; ND = Nondestructive

NO-OP Tests

The maintenance strategy for EMBEDDED AUDIX emulates the one for DIG-LINE. The tests listed below apply only to DIG-LINE and not to EMBEDDED AUDIX. These tests always return PASS.

- Electronic Power Feed test (#11)
- Station Lamp Updates test (#16)
- Station (Digital) Audits test (#17)
- Digital Terminal Remote Looparound test (#1201)

NPE Crosstalk Test (#9)

This test verifies that this port's NPE channel talks on the selected time slot and that it never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of a port's long test sequence, and it executes in about 20 to 30 seconds.

Crosstalk testing is performed on both the primary (for voice) and the secondary (for data) information channel associated with each EMBEDDED AUDIX port. If this test fails on either channel, the voice port is taken out-of-service.

Table 80: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available. Also, the port may have been busy during the test. **1** Check the port status. **2** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the port is active, it is unavailable for this test. Wait until the port is idle. **3** Retry the command at 1-minute intervals up to 5 times.
2	ABORT	System resources may not have been available, or the port may have been busy during the test. **1** Verify that the port's status is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be active. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the port is active, it is unavailable for certain tests. Refer to "Status" commands in Maintenance SAT Commands in Maintenance Commands Reference (555-245-101), for a full description of every possible state. Wait until the port is idle before testing. **2** If the port's status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.

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Table 80: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors.
1004	ABORT	The port was put in use during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the port is active, it is unavailable for certain tests. Refer to "Status" commands in Maintenance SAT Commands in Maintenance Commands Reference (555-245-101) for explanations of every possible state. Wait until the port is idle before testing.
1020	ABORT	Test disabled via background testing. Use **status station** to determine when the voice port is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. Failure code 1 indicates that the Crosstalk test failed on the primary channel. Failure code 2 indicates that the Crosstalk test failed on the secondary channel. **1** Replace the circuit pack (see caution at the beginning of this section).
	PASS	The port is using its allocated time slots correctly. **1** To verify that this is not an intermittent problem, repeat this test up to 10 times, and make sure it continues passing. **2** If complaints still exist, examine the connections.

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Voice and Control Channel Local Loop Test (#13)

This test checks the information and control channels between the server the EMBEDDED AUDIX port circuit. The server sends a message to loop around both the information and control channels for the port. First, the primary information (voice) channel loop back test is run.

While the primary information channel is still looped around, the Control Channel Looparound test is performed. The loop-around test for the secondary information (data) channel is then performed. This test is the same as the primary information channel's loop-around test.

Next, a Conference test is implemented for the primary information channel. This test is the same as Conference Test #6.

Only one value (Pass, Fail, or Abort) is generated as a result of the four tests run. If any test fails or aborts, the sequence is stopped.

Table 81: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be active. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. Wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots that are out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was put in use during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the voice port extension of the port. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before retesting.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 81: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
7	FAIL	Conference test failed on the primary channel. In some cases, users may not notice a disruption in service. In extreme cases, the conferencing feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port.
15	FAIL	The control channel between the processor and AUDIX is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port. This failure could also be disruptive to other users.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from no noticeable effect to loss of use of this port.
None	FAIL	The test failed for reasons external to the AUDIX. **1** Run circuit tests to check the Tone Generator circuit and the Tone Detector circuit using **test board *UUCSS* s**. **2** Resolve any problems detected on the Tone Generator circuit or Tone Detector circuit. **3** If both circuit packs are functioning properly and the test still fails, replace the AUDIX (see caution at the beginning of this section).
	PASS	Voice and Control Channel Local Loop test passed. Every channel are transmitting properly. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times, and see whether it continues to pass. **2** If complaints still exist, examine the connections.

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ADX16A-PT (AUDIX Analog Line/Control Link)

S8700 S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ADXCL-PT or ADX16A-PT	MINOR	**test port *location* l**	AUDIX Analog Line/ Control Link
ADXCL-PT or ADX16A-PT	WARNING	**test port *location* sh**	AUDIX Analog Line/ Control Link

1 For information on specifying a location, see Command Syntax on page 179.

CAUTION:
Never do any of the following without first shutting down AUDIX. Follow the instructions on the TN566/TN2169 faceplate:

- *Remove EMBEDDED AUDIX circuit packs*
- *Cycle power to a carrier containing EMBEDDED AUDIX circuit packs*
- *Remove power to a carrier containing EMBEDDED AUDIX circuit packs*

The ADX16A-PT MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack that is operating in control-link (CL) mode. For circuit-pack-level problems (ADX16A-BD or ANL-16-BD), see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. For port-level problems with AUDIX operating in digital-port mode, see:

- ADX8D-PT (AUDIX Digital Port) on page 203
- ADX16D-P (16-Port AUDIX Digital Port) on page 212

The tests described in this section apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110*.

AUDIX resides on a combined pair of circuit packs: the TN566 Multifunction board (MFB) and the TN2169 Alarm board (ALB). Because of its size this combination occupies 5 slots, but only 1 slot is functional as far as the switch is concerned. The other 4 slots are seen by the switch as "AUDIX-reserved" slots.

In CL mode the TN566 pack supports up to 16 voice ports. When a call to a station with an AUDIX login is not answered, AUDIX answers the call using one of the available voice ports.

Unlike other AUDIX systems, EMBEDDED AUDIX is not an adjunct.

Error Log Entries and Test to Clear Values

Table 82: EMBEDDED AUDIX Analog Line/Control Link Error Log Entries

Error Type	Aux Data	Associated Test		On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	40977	None			
18	0	**busyout station** ***extension***	WARNING	ON	**release station** ***extension***
23 (b)	0	None	WARNING	OFF	
130 (c)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257 (d)	40973	None			
513 (e)	Any	None			
1025 (f)		Looparound test (#161)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 2**
1281		Conference test (#7)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 2**
1537		NPE Crosstalk test (#6)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 2**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a Error Type 1: This is an in-line error that can only be resolved over time. This indicates that no terminal equipment was present when ringing was attempted. Execute the short **test port** ***UUCSSpp*** command.

b Error Type 23: The circuit pack was logically administered but not physically installed. The alarm will clear when the circuit pack is installed.

c Error Type 130: The circuit pack was removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

d Error Type 257: This is an in-line error and can only be resolved over time. This error indicates that ringing voltage is absent. If only one analog circuit pack in the system has this problem, replace the circuit pack. If only analog circuit packs on a particular carrier have this error, the ringing generator may not be connected to this carrier. If analog circuit packs on many carriers have this error, check the ringing generator.

e Error Type 513: AUDIX is not available to the switch. Check the AUDIX system, referring to *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110*.

f Error Type 1025: The TDM bus is out of service. See TDM-BUS (TDM Bus) on page 1832.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below. For example, by clearing error codes associated with the *Looparound* test (#161), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Looparound test (#161)		X	ND
Conference test (#7)		X	ND
NPE Crosstalk test (#6)		X	ND

1 D = Destructive; ND = Nondestructive

NO-OP Tests

The maintenance strategy for EMBEDDED AUDIX emulates the one for ANL-16-L. The tests listed below apply only to ANL-16-L and not to EMBEDDED AUDIX. These tests always return PASS.

- Battery Feed test (#35)
- Audits and Updates test (#36)
- Station Present test (#48)

Tests 36 and 48 ABORT when AUDIX is not running.

NPE Crosstalk Test (#6)

This test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of the long test sequence and executes in about 25 seconds.

Table 83: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use the **display port *UUCSSpp*** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the port is active, it is unavailable for certain tests. Wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.

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Table 83: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	Could not allocate the necessary system resources to run this test.[1]
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, then retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use the **display port *UUCSSpp*** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the port is active, it is unavailable for certain tests. Wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This condition indicates that the test is not applicable when the analog port is used in a combined modem pool. This error can be ignored.
1018	ABORT	Test disabled via administration. **1** To enable the test for the particular analog station being tested, enter the **change station *extension*** command and change the `Test` field on the Station screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2012	ABORT	System could not respond to this request.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

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Conference Circuit Test (#7)

This test verifies that the NPE channel for the port being tested can correctly perform the conferencing function.

Table 84: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled by administration. This only applies to analog stations. **1** To enable the test for the analog station being tested, enter **change station *extension*** and change the `Test` field on the Station screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

Loop-Around Test (#161)

This test is designed to check the on-board transmission capabilities of the NPE on the analog port.

Table 85: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled by administration. To enable the test for the particular analog station, enter **change station *extension*** and change the "Test" field on the Station screen to **y**.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The reflective loop-around test failed. This causes noisy or unreliable connections or other users calling this port may hear an echo. **1** Replace the circuit pack.
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

ALARM-PT (Alarm Port)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ALARM-PT	MINOR	**test port *location* l**	Alarm-Port
ALARM-PT	WARNING	**test port *location* sh**	Alarm-Port

1 For information on specifying a location, see Command Syntax on page 179.

The Alarm Port MO provides on-board maintenance for an analog line port that is administered as an external device alarm port. Tests are provided to verify the analog line ports ability to detect an external device alarm. The related MO, EXT-DEV ADMIN? Y (External Device Alarm) on page 972, is used for the off-board external device alarm.

S8100

For S8100, the analog line port that is administered for an external alarm may be a port on a virtual alarm board located in slot 1A11. The virtual board provides ports for External Device Alarm contacts to indicate non-Communication Manager alarms or a PC (global) alarm. There is no hardware associated with the virtual alarm board. The MO name for this board is PR-AL-BD and the external name displayed by the list configuration command is VIRTUAL ALARM BOARD. By default, this board is located in slot 1A11.

If the Alarm Port Maintenance Object is located on the virtual alarm board, the maintenance tests described below will always pass and there should never be an alarm or hardware error log entry for that MO.

Error Log Entries and Test to Clear Values

Table 86: 8-Port Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** <*address*>**sh r 1**
15 *	Any	Audits and Updates test (#36)			
18	0	**busyout station <*extension*>**	WARNING	OFF	**release station <*extension*>**
130 *		None	WARNING	ON	**test port** <*address*> **sh**
769 *		Battery Feed test (#35)	MINOR	ON	**test port** <*address*> **sh r 2**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

*** Additional Information:**

Error Type 15: This is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate errors.

Error Type 130: Indicates that the circuit pack or Media Module was removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack or Media Module.

Error Type 769: S8100: This test (Test #35) always passes for S8100.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below. For example, by clearing error codes associated with the Battery Feed test (#35), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed test (#35)	X	X	ND
Station Status and Translation Audits and Updates test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

Battery Feed Test (or Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery, and trying to detect a current.

S8100: This test always passes for S8100.

Table 87: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
S8100	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be reporting an external device alarm. **1** Before retesting, enter **test external-device-alarm port <*address*>** to determine whether the port is reporting an EXT-DEV failure. **2** If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times.
S8100 1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **1** If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times.
1004	ABORT	The port received an EXT-DEV failure during the test. The test has been aborted. **1** Before retesting, enter **test external-device-alarm port <*address*>** to determine whether the port is reporting an EXT-DEV failure. **2** If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times.

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Table 87: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
S8100 1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use the **display port PCSSpp** command to determine the station extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. **NOTE:** The battery feed circuitry is tested for proper battery voltage by testing the switchhook state. In response to the test message, the on-board firmware terminates the line and checks for switch-hook presence. The termination is then removed, and a check is made for no switch-hook presence. The MET set must be on-hook for the test to execute. **1** If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times.
S8100 1018	ABORT	Test disabled via software patch.
2000	ABORT	Response to the test request was not received within the allowable time period.
S8100 2000	ABORT	This port may have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <extension>** command and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals a maximum of 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **S8100**: This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The port's battery feed chip is unable to supply sufficient power to sense the external device alarm. This may occur when the test is performed at the same time that the external device contact closure occurs. **1** Before retesting, enter **test external-device-alarm port <*address*>** to determine whether the port is reporting an EXT-DEV failure. Wait until the port has no EXT-DEV failures before retesting. **2** Retry the command at 1-minute intervals up to 5 times.
S8100	FAIL	Battery Feed Test failed. This port is out-of-service. **1** Other ports on this circuit pack are not affected. Place user on a different port, if available, until a replacement circuit pack can be obtained. **2** Replace circuit pack when available.

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Table 87: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	PASS	The port's battery feed chip is able to provide power to the external device alarm to detect contact closure.
S8100	PASS	Battery Feed Test passed. Current flow is properly detected for this port. **1** If users are reporting problems, examine connections to the port.
S8100 0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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Station Status and Translation Audits and Updates Test (#36)

S8100: Port Updates Test (#36)

For an analog line port that is administered as an external alarm, this test is limited to updating the software with the switchhook state.

S8100: This test sends port level translation data from switch processor to the circuit pack to assure that the translation is correct. The port audit operation verifies the consistency of the current state of the port in the switch software.

Table 88: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
S8100	ABORT	Internal System Error. **1** Retry the command at 1-minute intervals a maximum of 5 times.

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Table 88: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
S8100 1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. Use the **display port PCSSpp** command to determine the station extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. **1** If the port is idle, retry the command at 1-minute intervals a maximum of 5 times.
1004	ABORT	The port received an EXT-DEV failure during the test. The test has been aborted. **1** Before retesting, enter **test external-device-alarm port <*address*>** to determine whether the port is reporting an EXT-DEV failure. **2** If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times.
1006	ABORT	This port has been busied out by command. **1** Check Error Log for Error Type 18 (port busied out). If present, use **release port <*address*>** to release the port and run the test again.
S8100 1006	ABORT	The test was aborted because the station is out of service. This condition may be accompanied by an error type 18 entry in the error log. You may want to determine why the station was taken out of service. (When stations are taken out of service by maintenance software, the problems that preceded that point must be cleared.) **1** Use the **status station** command to check the service state of the port. If the port is indeed out of service, enter the **release station** command to bring the station back into service. **2** Retry the command at 1-minute intervals a maximum of 5 times. **3** If the test continues to abort, and the service state indicates that the station is in service and idle, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
S8100 2000	ABORT	The test was aborted because response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals for a maximum of 5 times. **2** If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 88: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
1	FAIL	This failure does not indicate a hardware problem. The switchhook audit failed. This condition may occur when the audit is performed at the same time that the terminal equipment goes off-hook. **1** Before retesting, enter **test external-device-alarm port <*address*>** to determine whether the port is reporting an EXT-DEV failure. Wait until the port has no EXT-DEV failures. **2** If the port has no EXT-DEV failures, retry the command at 1-minute intervals up to 5 times.
7	FAIL	The translation update failed. This does not indicate a hardware problem but may be an internal software error.
S8100 7 or 8	FAIL	Test failed due to internal system error. Do not replace port board. • Error code 7: the failure occurred during station translation download (to DS1 Interface circuit pack). • Error code 8: the failure occurred during station ringer update. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	PASS	The software and the port processor have the same status.
S8100	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent.
S8100 0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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ANL-16-L (16-Port Analog Line)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ANL-16-L	MINOR	**test port *location* l**	16-Port Analog Line
ANL-16-L	WARNING	**test port *location* sh**	16-Port Analog Line

1 For information on specifying a location, see Command Syntax on page 179.

The circuit packs listed below provide 16 analog line ports for single-line voice terminals. The table below indicates which circuit packs are equipped with lightning protection (for off-premises, out-of -building stations), and which ones support the neon message waiting lamp feature.

16-Port Analog Line Circuit Packs

Circuit Pack	Off-Premises	Neon
TN468B	y	
TN479		
TN746		y
TN746B	y	y
TN2135	y	
TN2144	y	
TN2149	y	
TN2180	y	

S8100

These circuit packs provide 16 ports for analog voice terminals. The TN746, TN468, and TN749 support only single-line, on-premises/in-building, analog voice terminals, and not off-premises stations, since these circuit packs are not equipped with lightning protection. The TN746B, TN2144, TN2149, and TN468B support both on-premises and off-premises (that is, out-of-building) analog voice terminals. The TN468, TN468B, TN479, TN2135, TN2144, and TN2149 do NOT support the neon message waiting feature.

No maintenance of the terminal connected to the 16-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the neon message waiting lamp power and the common ringing application circuitry are reported as part of common port circuit pack errors; see errors 1281 and 1793 in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

Ringing Caused by Maintenance Testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled in the `Tests` field of the **change station *extension*** screen. Be aware that this action will also disable Tests #6, 7, 161, and 35.

Error Log Entries and Test to Clear Values

Table 89: 16-Port Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp sh* **r 1**
1(a)	40960 40975 40977	none			
15(b)	Any	Audits and Updates test (#36)			
18	0	**busyout station *extension***	WARNING	ON	**release station *extension***
130(c)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257(d)	40973	none			
513(e)		Station Present test (#48)	WARNING	OFF	**test port** *UUCSSpp* **sh r 2**
769		Battery Feed test (#35)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **sh r 2**
1025		Looparound test (#161)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 2**
1281		Conference test (#7)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 2**
1537		NPE Crosstalk test (#6)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 2**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a Error Type 1: These are in-line errors and can only be resolved over time.

Aux Data 40960 indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call causes an inline error from the board.

Aux Data 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal does not ring, then replace it. Otherwise, issue the **test port *UUCSSpp*** command, and follow the procedure for Test #48.

Aux Data 40977 indicates that no terminal equipment was connected when ringing was attempted. Run the short test via the **test port *UUCSSpp*** command, and follow the procedure for the results of Test #48.

b This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors.

c This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

d This is an in-line error and can only be resolved over time. This error indicates that ringing voltage is absent. If only 1 analog circuit pack in the system has this problem, then replace the circuit pack. If only analog circuit packs on a particular carrier have this error, then the ringing generator may not be connected to this carrier. If analog circuit packs on many carriers have this error, then it is probably a problem with the ringing generator.

e Associated Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this disturbs the customer or the terminal equipment, disable it by setting the `Tests` field on the **change station *extension*** screen to `n`. On some software releases, this will also disable Tests #6, 7, 161, and 35.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Battery Feed* test (#35), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed test (#35)	X	X	ND
Station Present test (#48)	X	X	ND
Looparound test (#161)		X	ND
Conference test (#7)		X	ND
NPE Crosstalk test (#6)		X	ND
Station Status and Translation Audits and Updates test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

S8100: One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conference functions on a per-port basis.

This test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually part of the long test sequence and executes in about 20 to 30 seconds.

Table 90: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use the **display port *UUCSSpp*** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the port is active, wait until the it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).

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Table 90: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to "**no**" on this station (this may be due to the ringing application Test #48, that can be customer or terminal disturbing. **1** To enable the test for a particular station being tested, enter **change station *extension*** and set the `Test` field on the station screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	This test can fail due to either on- or off-board problems. Off-board problems include EXP-PN and EXP-INTF (**S8700 IP**: RMC-ENV) faults, TDM-BUS faults, and faults associated with the Tone Detectors/Tone Generators. Clear every off-board problem before replacing the board. A TDM-BUS problem is usually the result of a faulty board connected to the backplane, or bent pins on the backplane. **1** Resolve any EXP-PN or EXP-INTF (**S8700 IP**: RMC-ENV) errors. **2** Resolve any TDM-BUS errors. **3** Resolve any TONE-BD or TONE-PT errors. **4** Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Conference Circuit Test (#7)

S8100

One or more NPEs reside on each circuit pack with a TDM Bus interface. The NPE controls port connectivity and gain, and provides conference functions on a per-port basis. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

This test verifies that the NPE channel for the port being tested can correctly perform the conferencing function.

Table 91: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to "**n**" on this station (this may be due to the ringing application Test #48, which can be customer or terminal disturbing). **1** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the `Test` field on the station to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 91: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	System resources required to run this test are not available. **1** Resolve any TONE-PT errors. **2** **S8100**: If there are no TONE-PT errors in the error log, retry the test at 1-minute intervals for a maximum of 5 times.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. **1** Issue **display port** and **status station** to determine whether the station is idle. If the station is idle, issue **test port** for this port. **2** If the test continues to fail, issue **busyout port** and **release port**, and retest. **3** If the test still fails, replace the board.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Battery Feed Test (or Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery and detecting the resulting current.

NOTE:
For the TN746B, Test #35 does not actually run and instead always returns PASS. Test #35 operates in the normal manner for TN746.

Table 92: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** Use the **display port *location*** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field was set to **n** on this station. It may be due to the ringing application Test #48, which can be customer or terminal disturbing. **1** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the `Test` field on the station to **y**.
S870 **0S85** **00S8** **300**13 92	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either **display port**, which shows that the port is a TTI port) or **list config**, which shows a `t` for the port. **2** If the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 92: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This could be a marginal test, and the terminal equipment may be operating satisfactorily. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack only if the customer is experiencing problems.
	PASS	The port's battery feed chip is able to provide power to the station equipment to detect on-/off-hook, but may not be able to supply power for touch-tones. If touch-tones are inoperative on this station, then replace the circuit pack because this port is inoperative. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Station Status and Translation Audits and Updates Test (#36)

This test updates the analog port's message lamp state (if it has one) and translations with information in the software.

S8100

The software is updated with the switchhook state reported by the port processor. When the ringer is in the off state, this test also turns off the station's ringer to prevent constant ringing caused by defective hardware.

Table 93: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times. **3** **S8100**: If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1006	ABORT	This port has been busied out by command, or taken out-of-service by the failure of the NPE Crosstalk test. **1** Look in the error log for error type 18 (port busied out) for this port. If this error is present, release the port with **release station *extension***, and run the test again. **2** Check the error log for error type 1025 (NPE crosstalk test failed) for this port. If this error is present, investigate the errors associated with the NPE Crosstalk test (#6). **3** Make sure that the terminal is connected and in service, and then retest.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	This does not indicate a hardware problem. The switchhook audit failed. The other updates were not performed because of this failure. This may occur when the audit is performed at the same time the terminal equipment goes off-hook. **1** Use **status station** to determine when the port is available. **2** Retry the command at 1-minute intervals up to 5 times.
5	FAIL	This may be an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure.
7	FAIL	The translation update failed. There may be an internal software error. The ringer update was not performed because of this failure.

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Table 93: Test #36 Station Status and Translation Audits and Updates *Continued*

Error Code	Test Result	Description / Recommendation
8	FAIL	This does not indicate a hardware problem. There may be an internal software error. The ringer update failed. **S8100**: The switchhook audit failed. The other updates were not performed because of this failure. This may occur when the audit is performed at the same time that the terminal equipment goes off-hook. Use the **status station** command to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
S81005	FAIL	This does not indicate a hardware problem. However, there may be an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure.
S81007	FAIL	The translation update failed. This does not indicate a hardware problem. However, there may be an internal software error. The ringer update was not performed because of this failure.
S81008	FAIL	This does not indicate a hardware problem. However, there may be an internal software error. The ringer update failed. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	PASS	The software and the port processor have the same status. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command and resolve problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Station Present Test (or Ringing Application Test) (#48)

This test applies momentary ringing voltage to the terminal equipment and monitors resulting current flow to determine whether terminal equipment is connected to the port. This test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, you can disable it via the Tests field on the **change station** screen. However, on some software releases, Tests #6, 7, 161, and 35 are disabled.

Table 94: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **S8100**: Use the **display port *location*** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. **1** If the port status is idle, then retry the command at 1-minute intervals a maximum of 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. If the service state indicates that the port is active, wait until it is idle. **3** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1008	ABORT	Could not allocate a ringing circuit. Either every ringing circuit is active or the ringing generator is either defective or incorrectly wired. Retry the command at 1-minute intervals up to 5 times. **1** If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is incorrectly wired. If it does not occur on other ports, then all four ring phases are active.
1018	ABORT	The test has been disabled by administration. The default for the **Test** field on the station screen is **y**. Determine why this field was set to **n** on this station. It may be due to the brief ringing disturbance that this test may cause. **1** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the Test field on the station to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 94: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	FAIL	The terminal equipment is not connected to the circuit pack. Some terminal equipment, such as modems, may fail even when connected properly. **1** Remotely test the equipment. **2** If the test fails again, look for RING-GEN errors in the Error Log. **3** Check all of the wiring between the station equipment and the switch. Then, run the test again. **4** If the test still fails, the set may be defective. Check the set, and replace it, if necessary. **5** Some terminal equipment could fail even when it is connected properly. If this is the case, disable the test using the **change station *extension*** command (enter **n** into the `Test` field). Note that this action also disables Tests 6, 7, 161, and 35 on this port.
	PASS	The station is connected properly to the switch. This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch. Investigate user-reported troubles on this port by using other port tests or by examining the station and its wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Loop-Around Test (#161)

This test checks the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the analog port. The test passes if the signal measured by the Tone Detector is within acceptable limits.

Table 95: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. If the port is active, wait until it is idle. **3** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not run on ports administered as External Alert, Announcement or combined modem pool ports. This error can be ignored.
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field was set to **n** on this station. It may be due to the ringing application Test #48, which can be customer or terminal disturbing. **1** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the `Test` field on the station to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 95: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
	FAIL	The reflective loop around test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board. **1** Since the test may be affected by a line seizure, repeat the test at 1-minute intervals up to 5 times. **2** Run circuit pack tests to check the IPSI Tone Generator circuit or Tone Generator circuit pack and the IPSI Tone Detector circuit or Tone Detector circuit pack by using the **test board *location* short** command. **3** Resolve any problems on the Tone Generator circuit or the Tone Detector circuit. **4** If the Tone Generator and Tone Detector circuits are functioning properly and the test still fails and a voice terminal is connected and wired properly, replace the analog line circuit pack.
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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ANL-24-L (24-Port Analog Line)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ANL-24-L	MINOR	**test port *location* l**	24-Port Analog Line
ANL-24-L	WARNING	**test port *location* sh**	24-Port Analog Line

1 For information on specifying a location, see Command Syntax on page 179.

The 24-Port Analog Line circuit pack (TN793) provides 24 ports for voice terminals and supports both on-premises and off-premises analog voice terminals.

No maintenance of the terminal connected to the 24-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the neon message waiting lamp power and the common ringing application circuitry are reported as part of common port circuit pack errors. See errors 1281 and 1793 in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

NOTE:
This analog line circuit pack supports analog data modules. When assigned, analog data modules provide access to the NetPkt (TN794) data ports. To activate an analog data module you must assign the port location on the data screen and connect a modem to the port. (The analog data module may be used for connection to a CDR output or other adjuncts as needed.) These ports are tested like any other analog port on the circuit pack.

Ringing Caused by Maintenance Testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled in the `Test` field of the **change station *extension*** screen. Be aware that this action also disables Tests #6, 7, 161, and 35.

Error Log Entries and Test to Clear Values

Table 96: 24-Port Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1(a)	40960 40975 40977	none			
15(b)	Any	Audits and Updates test (#36)			
18	0	**busyout station** *extension*	WARNING	ON	**release station** ***extension***
130(c)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257	40973	none			
513 (d) (e)		Station Present test (#48)	WARNING	OFF	**test port** *UUCSSpp* **sh r 2**
769		Battery Feed test (#35)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **sh r 2**
1025		Looparound test (#161)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 2**
1281		Conference test (#7)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 2**
1537		NPE Crosstalk test (#6)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 2**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a These are in-line errors and can only be resolved over time.

Aux Data 40960 indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call will cause an inline error from the board.

Aux Data 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal does not ring, then replace it. Otherwise, issue the **test port *location*** command, and follow the procedure for Test #48.

Aux Data 40977 indicates that no terminal equipment was connected when ringing was attempted. Run the short test via the **test port *location*** command, and follow the procedure for the results of Test #48.

b This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors.

c This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

d This is an in-line error and can only be resolved over time. This error indicates that ringing voltage is absent. If only 1 analog circuit pack in the system has this problem, then replace the circuit pack. If only analog circuit packs on a particular carrier have this error, then the ringing generator may not be connected to this carrier. If analog circuit packs on many carriers have this error, then it is probably a problem with the ringing generator.

e Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this disturbs the customer or the terminal equipment, disable it by setting the `Tests` field on the **change station *extension*** screen to **n**. On some software releases, this also disables Tests #6, 7, 161, and 35.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Battery Feed* test (#35), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed test (#35)	X	X	ND
Station Present test (#48)	X	X	ND
Looparound test (#161)	**S8100**: X	X	ND
Conference test (#7)	**S8100**: X	X	ND
NPE Crosstalk test (#6)	**S8100**: X	X	ND
Station Status and Translation Audits and Updates test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

This test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually part of the long test sequence and executes in about 20 to 30 seconds.

Table 97: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. If the port is active, wait until it is idle before testing. **3** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application Test #48, that can be customer or terminal disturbing). **1** To enable the test for a particular station being tested, enter **change station *extension*** and set the `Test` field on the station to **y**.

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Table 97: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	This test can fail due to either on- or off-board problems. Off-board problems include EXP-PN and EXP-INTF (**S8700 IP**: RMC-ENV) faults, TDM-BUS faults, and faults associated with the Tone Detectors/Tone Generators. Clear every off-board problem before replacing the board. A TDM-BUS problem is usually the result of a faulty board connected to the backplane, or bent pins on the backplane. **1** Resolve any EXP-PN and EXP-INTF (**S8700 IP**: RMC-ENV) errors. **2** Resolve any TDM-BUS errors. **3** Resolve any TONE-BD or TONE-PT errors. **4** Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Conference Circuit Test (#7)

This test verifies that the NPE channel for the port being tested can correctly perform the conferencing function.

Table 98: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station. It may be due to the ringing application Test #48, which can be customer or terminal disturbing. **1** To enable the test for a particular station being tested, enter **change station *extension*** and set the `Test` field on the station screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Resolve TONE-PT errors. **2** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. **1** Issue **display port** and **status station** to determine whether the station is idle. If the station is idle, issue **test port** for this port. **2** If the test continues to fail, issue **busyout port** and **release port**, and retest. **3** If the test still fails, replace the board.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

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Table 98: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Battery Feed Test (or Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery and detecting the resulting current.

NOTE:
For the TN746B, Test #35 does not actually run and instead always returns PASS. Test #35 operates in the normal manner for TN746.

Table 99: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.

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Table 99: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station. It may be due to the ringing application test 48, that can be customer or terminal disturbing. **1** To enable the test for a particular station being tested, enter **change station *extension*** and set the `Test` field on the station screen to **y**.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either **display port**, which shows that the port is a TTI port, or **list config**, which shows a `t` for the port. **2** If the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This could be a marginal test, and the terminal equipment may be operating satisfactorily. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack only if the customer is experiencing problems.
	PASS	The port's battery feed chip is able to provide power to the station equipment to detect on-/off-hook, but may not be able to supply power for touch-tones. If touch-tones are inoperative on this station, then replace the circuit pack because this port is inoperative. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

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Table 99: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Station Status and Translation Audits and Updates Test (#36)

This test updates the analog port's message lamp state (if it has one) and translations with information in the software.

Table 100: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).

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Table 100: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
1006	ABORT	This port has been busied out by command, or taken out-of-service by the failure of the NPE Crosstalk test. **1** Look in the Error Log for error type 18 (port busied out) for this port. If this error is present, release the port with the **release station *extension*** command, and run the test again. **2** Check the Error Log for error type 1025 (NPE crosstalk test failed) for this port. If this error is present, investigate the errors associated with the NPE Crosstalk test (#6). **3** Make sure that the terminal is connected and in service, and then retest.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	This does not indicate a hardware problem. The switchhook audit failed. The other updates were not performed because of this failure. This may occur when the audit is performed at the same time the terminal equipment goes off-hook. **1** Use **status station** to determine when the port is available and retry the command at 1-minute intervals up to 5 times.
5	FAIL	This may be an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure.
7	FAIL	The translation update failed. There may be an internal software error. The ringer update was not performed because of this failure.
8	FAIL	This does not indicate a hardware problem. There may be an internal software error. The ringer update failed. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The software and the port processor have the same status. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

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Table 100: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify the board's translations are correct. Use the **list config** command and resolve problems. **2** If the board was found to be correctly inserted in step 1, issue **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Station Present Test (or Ringing Application Test) (#48)

This test applies momentary ringing voltage to the terminal equipment and monitors resulting current flow to determine whether terminal equipment is connected to the port. This test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, you can disable it via the `Tests` field on the **change station** screen. However, on some software releases, Tests #6, 7, 161, and 35 are disabled.

Table 101: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).

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Table 101: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
1008	ABORT	Could not allocate a ringing circuit. Either every ringing circuit is active, or the ringing generator is either defective or incorrectly wired. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is incorrectly wired (see errors for RING-GEN). If it does not occur on other ports, then all four ring phases are active.
1018	ABORT	The test has been disabled by administration.The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station. It may be due to the brief ringing disturbance that this test may cause. **1** To enable the test for a particular station being tested, enter **change station *extension*** and set the `Test` field on the station screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The terminal equipment is not connected to the circuit pack. Some terminal equipment, such as modems, may fail even when connected properly. **1** Remotely test the equipment. **2** If the test fails again, look for RING-GEN errors in the error log. **3** Check all of the wiring between the station equipment and the switch. Then, run the test again. **4** If the test still fails, the set may be defective. Check the set, and replace it, if necessary. **5** Some terminal equipment could fail even when it is connected properly. If this is the case, disable the test using the **change station *extension*** command (enter **n** into the `Test` field). Note that this action also disables Tests 6, 7, 161, and 35 on this port.
	PASS	The station is connected properly to the switch. This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch. Investigate user-reported troubles on this port by using other port tests or by examining the station and its wiring.

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Table 101: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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Loop-Around Test (#161)

This test checks the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the analog port. The test passes if the signal measured by the Tone Detector is within acceptable limits.

Table 102: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.

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Table 102: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. **2** Use **status station** to determine the service state of the port. **3** If the port is active, wait until it is idle, and retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not run on ports administered as External Alert, Announcement or combined modem pool ports. This error can be ignored.
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application test 48, that can be customer or terminal disturbing). **1** To enable the test for a particular station being tested, enter **change station *extension*** and set the `Test` field on the station screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The reflective loop around test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board. **1** Since the test may be affected by a line seizure, repeat the test at 1-minute intervals up to 5 times. **2** Run circuit tests to check the Tone Generator circuit and the Tone Detector circuit by using **test board *location* short**. **3** Resolve any problems on the Tone Generator circuit or the Tone Detector circuit. **4** If the Tone Generator and Tone Detector circuits are functioning properly and the test still fails and a voice terminal is connected and wired properly, replace the analog line circuit pack.
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

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Table 102: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, verify that a valid board is inserted.

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ANL-BD (Analog Line Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name Of MO
S8100: ANL-BD	MINOR WARNING	**test board *location* sh**	8-Port Analog Line circuit pack
S8100: ANL-BD	MINOR WARNING	**test board *location* sh**	8-Port Neon Analog Line circuit pack
ANL-BD	MINOR WARNING	**test board *location* sh**	16-Port Neon Analog Line circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also ANL-16-L (16-Port Analog Line) on page 232 for related line information.

S8100: See also ANL-LINE, ANL-NE-L (8-Port Analog Line) on page 263 for related line information.

ANL-LINE, ANL-NE-L (8-Port Analog Line)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command To Run[1]	Full Name of MO
ANL-LINE	MINOR	**test port *location* l**	8-Port Analog Line
ANL-LINE	WARNING	**test port *location* sh**	8-Port Analog Line
ANL-NE-L	MINOR	**test port *location* l**	8-Port Neon Analog Line
ANL-NE-L	WARNING	**test port *location* sh**	8-Port Neon Analog Line

1 For information on specifying a location, see Command Syntax on page 179.

The 8-port Analog Line circuit packs,

		S8100:
TN712	TN411 [G3rV2]	TN742
	TN443 [G3r V2]	TN769
	TN443 [G3r V2]	TN467 [G3r V2]

each provide eight ports for single-line, on or off-premises analog endpoints such as analog voice terminals, queue warning level lamps, recorded announcements, dictation machines, PAGEPAC paging equipment, external alerting devices, modems, fax machines, and AUDIX voice ports. Only the TN769 supports a neon message waiting lamp.

NOTE:
PAGEPAC is a registered trademark of Harris Corporation, Dracon Division.

Test #48 may cause some terminal equipment to ring briefly during daily maintenance, which may disturb the customer or the terminal equipment. Test #47 may cause a false alarm when the port is connected to certain off-premises equipment, non-voice terminal equipment, or loop equipment. In either case, the tests can be disabled by entering **n** in the `Tests` field on the **change station *extension*** screen. Be aware that this will disable Tests 6, 35, 47, and 48.

No maintenance of the terminal connected to the 8-Port Analog Line circuit pack or 8-Port Neon Analog Line circuit pack is performed, except to determine whether or not the terminal is connected. Failures of the common ringing application circuitry and the neon message waiting lamp power (ANL-NE-L only) are reported as errors 1281and 1793 against XXX-BD (Common Port Circuit Pack) in Table 899, Common Port Circuit Pack Maintenance Error Log Entries, on page 2090.

Hardware Error Log Entries and Test to Clear Values

Table 103: 8-Port Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	40960 40977 40975	None			
15 (b)	Any	Audits and Updates test (#36)			
18	0	**busyout station** ***extension***	WARNING	OFF	**release station** ***extension***
130 (c)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257 (d)		Station Present test (#48)	WARNING	OFF	**test port** *UUCSSpp* **sh r 3**
513		Battery Feed test (#35)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **sh r 2**
769 (e)		Loop Around and Conference test (#47)			**test port** *UUCSSpp* **l r 3**
1025		NPE Crosstalk test (#6)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 3**
1281 (f)					
1793 (f)					

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a These are in-line errors that can only be resolved over time.

Aux Data 40960 Indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call will cause an inline error from the board.

Aux Data 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal doesn't ring, then replace it. Otherwise, issue the **test port** ***location*** command, and follow the procedure for Test #48.

Aux Data 40977 indicates that no terminal equipment was connected when ringing was attempted. Run the short test via the **test port** ***location*** command, and follow the procedure for the results of Test #48.

b This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate errors (if any).

c This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d Associated Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled via the **change station *extension*** command. However, on some releases of the software, this will disable Tests #6, 47, and 35 as well as Test #48.

e Associated Test #47 may cause a false alarm when the port is connected to off-premises equipment, some non-voice terminal equipment, and some loop equipment. If this causes a false alarm, use **change station,** and change the `Tests` field to **n** to disable the test.

f See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Battery Feed* test (#35), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed test (#35)	X	X	ND
Station Present test (#48)	X	X	ND
NPE Crosstalk test (#6)		X	ND
Loop Around and Conference test (#47)		X	ND
Station Status and Translation Audits and Updates test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more NPEs (Network Processing Elements) reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 104: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-on-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, it will be unavailable for certain tests. Wait until the port is idle before retesting. **2** When the port is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve TTR-LEV errors. **2** Resolve TONE-PT errors. **3** Retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *location*** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This code occurs under either of the following conditions: • This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, a modem pool member or music on hold). • The circuit pack is one of the following: — TN742 vintage 13, 14, or 15 — TN769 vintage 3, 4, or 5

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Table 104: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	Test disabled by administration. The default for the `Test` field on the station screen is **y**; thus, you may want to determine why this field has been set to **n** on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). **1** To enable the test for a particular station, enter **change station *extension*** and set the `Test` field to **y**.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a Tone-Clock problem). The Tone-Clock and Tone Detectors could be having a communication problem. For example, the companding modes could be out of synchronization. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 104: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	This test can fail due to either on- or off-board problems. Off-board problems of concern include EXP-PN and EXP-INTF (**S8700 IP**: RMC-ENV) faults, TDM-BUS faults, and faults associated with the Tone Detectors/Tone Generators. Clear every off-board problem before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. **1** Resolve EXP-PN and EXP-INTF (**S8700 IP**: RMC-ENV) errors. **2** Resolve TDM-BUS errors. **3** Resolve TONE-BD or TONE-PT errors. **4** Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for circuit packs TN712 prior to Vintage 14 and TN742 prior to Vintage 6 (**S8100**: Vintage 4).
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted.

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Battery Feed Test (or Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery, and trying to detect a current.

Table 105: Test #35 Battery Feed Test Results

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-on-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. Refer to Chapter 1, "Maintenance SAT Commands" in the Maintenance Commands Reference (555-245-101), for a full description of every possible state. If the port is active, it will be unavailable for certain tests. Wait until the port is idle before retesting. **2** When the port is idle, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *location*** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, then the port is unavailable for certain tests. Refer to Chapter 1, "Maintenance SAT Commands" in the Maintenance Commands Reference (555-245-101), for a full description of every possible state. Wait until the port is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This error code occurs under either of the following conditions: **1** This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). **2** The circuit pack is one of the following: — TN742 vintages 13,14, and 15 — TN769 vintages 3, 4, and 5
1018	ABORT	Test disabled via administration. The default for the `Test` field on the is **y**. Determine why this field was set to **n** on this station. It may be due to the ringing application Test E48, which can be customer or terminal disturbing. **1** To enable the test for a particular station, enter **change station *extension*** and set the `Test` field to **y**.

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Table 105: Test #35 Battery Feed Test Results

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a `t` for the port). **2** If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a Tone-Clock problem). The Tone-Clock and Tone Detectors could be having a communication problem. For example, the companding modes could be out of synchronization. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This may occur when the test is performed at the same time that the terminal equipment goes off-hook. **1** Use **status station** to determine when the port is available for testing. When the port becomes available for testing, retry the command at 1-minute intervals a minimum of five times. **2** If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack only if the customer is experiencing problems.
	PASS	The port's battery feed chip is able to provide power to the station equipment to detect on-/off-hook. However, the battery feed chip may still be unable to provide power for touch-tones. If tones are heard when buttons are pressed, then the battery feed chip is functioning correctly; otherwise, replace the circuit pack because this port is defective. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for circuit packs TN712 prior to Vintage 14 and TN742 prior to Vintage 6.

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Table 105: Test #35 Battery Feed Test Results

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted.

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Station Status and Translation Audits and Updates Test (#36)

This test updates the analog port's message lamp state (if it has one) and translations (such as station type, dial type, network connection) with information kept in the software. The software is updated with the switchhook state reported by the port processor. When the ringer is in the off state, this test also turns off the station's ringer to prevent constant ringing caused by defective hardware.

Table 106: Test #36 Station Status and Translation Audits and Updates Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test.
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *location*** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is active, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort and the port is idle, escalate the problem.

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Table 106: Test #36 Station Status and Translation Audits and Updates Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	The test was aborted due to a configuration problem. This error code occurs under either of the following conditions: **1** This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). **2** The circuit pack is one of the following: — TN742 vintages 13,14, and 15 — TN769 vintages 3, 4, and 5
1006	ABORT	This port has been busied out by command or taken out-of-service by the failure of the NPE Crosstalk test. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error is present, then release the port with **release station *extension*** and run the test again. **2** Look in the Error Log for Error Type 1025 (NPE Crosstalk test failed) for this port. If this error is present, then investigate the errors associated with the NPE Crosstalk test (#6) first. **3** Make sure that the terminal is connected and in service, and then retest.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	This does not indicate a hardware problem. The switchhook audit failed, and the other updates were not performed because of this failure. This condition may occur when the audit is performed at the same time that the terminal equipment goes off-hook. Use the **status station** command to determine when the port is available for testing. **1** When the port becomes available for testing, retry the command at 1-minute intervals up to 5 times.
5	FAIL	This does not indicate a hardware problem but may indicate an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure.
7	FAIL	The translation update failed. The ringer update was not performed because of this failure. This does not indicate a hardware problem but may be an internal software error.
8	FAIL	This does not indicate a hardware problem but may be an internal software error. The ringer update failed. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 106: Test #36 Station Status and Translation Audits and Updates Test

Error Code	Test Result	Description / Recommendation
	PASS	The software and the port processor have the same status. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for circuit packs TN712 prior to vintage 14 and TN742 prior to vintage 6.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted.

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Looparound and Conference Test (#47)

Each Analog port consists of:

- An NPE (Network Processing Element) for port connectivity and gain, and conferencing functionality
- A codec that converts TDM Bus digital signals to analog
- A battery feed chip that provides power to the telephone set for signaling, dial pulsing, transmission, and balance.

This test is designed to check the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the Analog port. A Tone Detector and a Tone Generator talk and listen on the same pair of time slots as the Analog port. The Analog port is then instructed to go into loop around mode (see Figure 21, Analog Looparound and Conference Test, on page 274). The test passes if the signal measured by the Tone Detector is within acceptable limits.

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. Test #47 also tests the operation of the port conference circuits in the NPE for three and four parties. In addition, a test is run to measure noise. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

The noise test is performed by filtering out the tone, and then measuring inherent port noise.

NOTE:
This loop-around test is sensitive to the length of the loop, the equipment in the loop, or the equipment terminating the loop, such as off-premises stations. If this test is causing a false alarm, use **change station** for this station and change the `Tests` field to **n**, to disable the test.

Figure 21: Analog Looparound and Conference Test

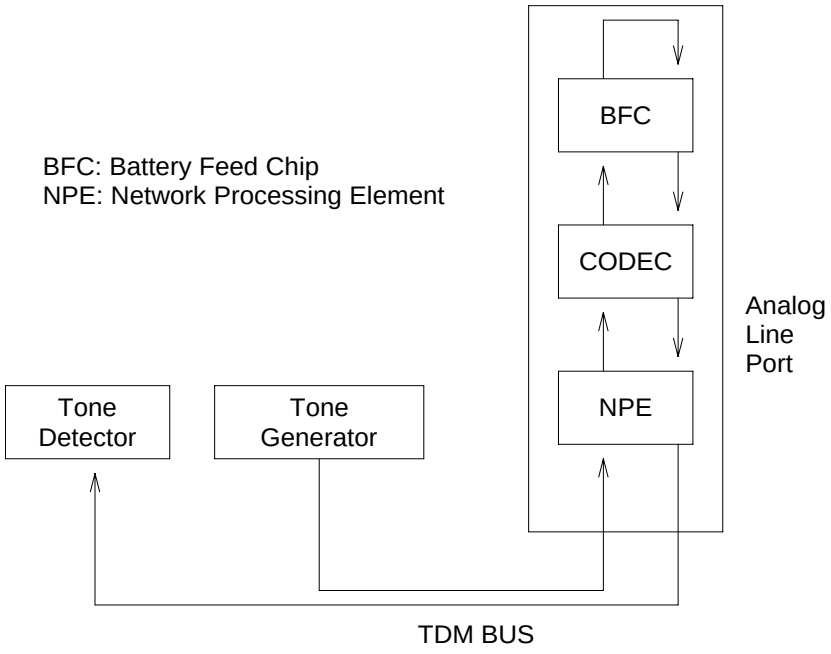

Table 107: Test #47 Loop Around and Conference Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
7	ABORT	The port was seized by a user for a valid call. **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, it will be unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port is idle, retry the command at 1-minute intervals up to 5 times.

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Table 107: Test #47 Loop Around and Conference Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. (This could be a Music-on-Hold port.) **1** Enter **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, it will be unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve TTR-LEV errors. **2** Resolve TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized for a valid call during the conference or noise test. **1** If the circuit pack is a TN742 of Vintage 10 or less, this test is not valid. Otherwise, proceed with step 2. **2** When the port is available for testing, retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This error code occurs under either of the following conditions: • This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, a modem pool member or music on hold). • The circuit pack is one of the following: — TN742 vintage 13, 14, or 15 — TN769 vintage 3, 4, or 5
1018	ABORT	Test disabled by administration. The default for the `Test` field is **y.** Determine why the field is **n** on this station. It may be due to the ringing application test 48, which can be customer or terminal disturbing. **1** To enable the test for a particular station, enter **change station *extension*** and set the `Test` field on the Station screen to **y**.

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Table 107: Test #47 Loop Around and Conference Test

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either **display port** to show that the port is a TTI port, or **list config**, where the display shows a `t` for the port. **2** If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a Tone-Clock problem). The Tone-Clock and Tone Detectors could be having a communication problem. For example, the companding modes could be out of synchronization. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 107: Test #47 Loop Around and Conference Test

Error Code	Test Result	Description / Recommendation
7	FAIL	The conference test or the noise test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board, as described below.
13		The reflective loop around with gain set to low and the 600-ohm balance failed. This will cause noisy or unreliable connections.
14		The reflective loop around test (with the gain set to high, using RC balance) failed. This could cause noisy or unreliable connections. The problem can also be off-board, as described below.
15		The nonreflective loop-around test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board as described below. **1** Disconnect the terminal equipment from the circuit pack at the cross-connect and run the test again. **2** If the test fails again, replace the circuit pack and reconnect the terminal equipment. If the test passes the second time, then the test results were affected by the terminal equipment connected to the port. In this case, ignore the results of this test if every other test passes or aborts and the station is operating properly. Failure of test 47 does not cause an alarm. If there are failures of other tests, then investigate those errors. User reported troubles with this port should be investigated by using other port tests, by examining station wiring, and by examining the station to ensure that it is correctly translated as off-premises or on-premises. If the Looparound and Conference circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit circuit pack or a 631DB AC power unit, but not both types of power units. To investigate problems with the power unit, see the RMC-ENV MO (**S8700 IP**), or the CARR-POW MO (**S8700 MC**). If a red LED is lit on TN736 or TN752 power unit circuit pack, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test.

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Table 107: Test #47 Loop Around and Conference Test

Error Code	Test Result	Description / Recommendation
	PASS	The port is able to provide an analog transmission path to the station equipment. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, by examining the station, and by ensuring that the terminal is correctly translated as off-premises or on-premises. **NOTE:** This test always passes for circuit packs TN712 prior to vintage 14 and TN742 prior to vintage 6.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted.

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Station Present Test (or Ringing Application Test) (#48)

This test provides a burst of ringing current to the terminal equipment and detects that current flows. This test is to ascertain whether or not terminal equipment is connected to the port.

This test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing is disturbing the customer or the terminal equipment, it should be disabled using the Tests field of the station administration screen. However, on some releases of the software, this action disables Tests #6, 47, and 35, as well as Test #48.

Table 108: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Use the **display port *location*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is active, it will be unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port is idle, retry the command at 1-minute intervals up to 5 times. **3** Check for phone left off-hook or for wiring problems.
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use the **display port *location*** command to determine the station extension. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is active, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	The test was aborted due to a configuration problem. This error code occurs under either of the following conditions: **1** This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or music on hold). **2** The circuit pack is one of the following: — TN742 vintages 13, 14, and 15 — TN769 vintages 3, 4, and 5
1008	ABORT	Could not allocate a ringing circuit for one of the following reasons: • Every ringing circuit is active • The ringing generator is defective • It is incorrectly wired **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for Test #48 on other circuit packs as well, then the ringing generator may be defective or incorrectly wired. If it does not occur on other ports, then that circuit pack is currently using all four ringing phases.

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Table 108: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	The test was disabled by administration. The default for the `Test` field is **y**; thus, you may want to determine why this field has been set to "**n**" on this station (this may be due to the ringing application Test #48, which can be customer or terminal disturbing). **1** To enable the test for a particular station, enter **change station *extension*** and set the `Test` field to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. Either a system allocation to get information about the port or to put the port into a service state failed or the attempt to put the port in connection with a tone source failed (this could be a Tone-Clock problem). The Tone-Clock and Tone Detectors could be having a communication problem. For example, the companding modes could be out of synchronization. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
	FAIL	The terminal equipment is not connected to the circuit pack or the ringing generator may have failed. **1** Remotely test the equipment. **2** If the test fails again, look for RING-GEN errors in the error log. If present, see RING-GEN (Analog Ring Generator) on page 1587 (analog ring generator) maintenance. **3** Check all of the wiring between the station equipment and the switch. Then, run the test again. **4** If the test still fails, the set may be defective. Check the set, and replace it, if necessary. **5** Some terminal equipment (such as a modem) could fail even when it is connected properly. If this is the case, disable the test using the **change station *extension*** command (enter **n** into the `Test` field). Note that this action also disables Tests 6, 7, 161, and 35 on this port.
	PASS	The station is connected properly to the switch. This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch. Investigate user-reported troubles on this port by using other port tests or by examining the station and its wiring. **NOTE:** **S8100**: This test always passes for circuit pack TN742 prior to vintage 6.

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Table 108: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **list config** and resolve any problems. **2** If the board was found to be correctly inserted in step 1, use **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted.

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AN-LN-PT (Analog Line Port)

S8700 / S8500 / S8300 / G700 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
AN-LN-PT	MINOR	**test port *location* l**	Analog Line port
AN-LN-PT	WARNING	**test port *location* sh**	Analog Line port

1 For information on specifying a location, see Command Syntax on page 179.

The TN793B/TN2793B Analog Line (w/ Caller ID) and the TN797 Analog Trunk and Line circuit packs both support this MO.

The TN793B/TN2793B Analog Line circuit pack (w/ Caller ID) provides 24 ports for voice terminals and supports both on-premises and off-premises analog voice terminals.

NOTE:
The TN793B/TN2793B analog line circuit pack supports analog data modules. When assigned, analog data modules provide access to the NetPkt (TN794 circuit pack) data ports. To activate an analog data module you must assign the port location on the data screen and connect a modem to the port. The analog data module can be used for connection to a CDR output, or other adjuncts as needed. These ports are tested like any other analog port on the circuit pack.

The TN797 Analog Trunk and Line circuit pack provides 8 ports, each of which may be administered in any of several ways, as described in MO TR-LN-BD.

S8300 / **G700**: The MM711 Analog Trunk and Line Media Module provides 8 ports, each of which may be administered in any of several ways, as described in MO MG-ANA.

NOTE:
Although the AN-LN-PT MO is provided for the G700 Media Gateways, this MO only partially supports the MM711 Analog Media Module.

Ringing caused by maintenance testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, disable it in the `Tests` field of the **change station <*extension*>** form. Be aware that this action also disables Tests #6, 7, 161, and 35 on some software releases.

G700: Tests #6, 7, and 161 abort on the G700 with Error Code 1412.

Error log entries and test to clear values

Table 109: Analog line error log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** <*address*> **sh r 1**
1*	40960 40975 40977	none			
15*	Any	Audits and Updates test (#36)			
18	0	**busy station <*extension*>**	WARNING	ON	**release station <*extension*>**
130*		None	WARNING	ON	**test port** <*address*> **sh**
257*	40973	None			
513*		Station Present test (#48)	WARNING	OFF	**test port** <*address*> **sh r 2**
769		Battery Feed test (#35)	MINOR WARNING[2]	ON	**test port** <*address*> **sh r 2**
1025		Looparound test (#161)	MINOR WARNING[2]	ON	**test port** <*address*> **l r 2**
1281		Conference test (#7)	MINOR WARNING[2]	ON	**test port** <*address*> **l r 2**
1537		NPE Crosstalk test (#6)	MINOR WARNING[2]	ON	**test port** <*address*> **l r 2**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in the **set options** command.

**** Additional Information:***

Error Type 1: these are inline errors and can only be resolved over time.

- Aux Data 40960 indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call causes an inline error from the board.
- Aux Data 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance.

  1 Call the terminal equipment and verify that the terminal rings.

  2 If the terminal does not ring, replace it.

  3 Otherwise, issue the **test port *location*** command, and follow the procedure for Test #48.

- 40977 indicates that no terminal equipment was connected when ringing was attempted.

  1 Run the short test via the **test port *location*** command, and follow the procedure for the results of Test #48.

Error Type 15: this is a software audit error that does not indicate any hardware malfunction.

1 Run the short test sequence, and investigate any associated errors.

Error Type 130: this error type indicates that the circuit pack or media module has been removed or has been insane for more than 11 minutes.

1 To clear the error, reseat or replace the circuit pack or media module.

Error Type 257: this is an in-line error and can only be resolved over time. This error indicates that ringing voltage is absent.

S8700 / S8500 / S8100

1 If only 1 analog circuit pack in the system has this problem, replace the circuit pack.

2 If only analog circuit packs on a particular carrier have this error, the ringing generator may not be connected to this carrier.

3 If analog circuit packs on many carriers have this error, it is probably a problem with the ringing generator.

S8300 / G700

1 If not resolved over time, replace the media module.

Error Type 513: Test #48 can cause some terminal equipment to ring briefly during daily maintenance.

1 If this disturbs the customer or the terminal equipment, disable it by setting the `Tests` field on the **change station *extension*** form to **n**. On some software releases, this also disables Tests #6, 7, 161, and 35.

S8300 / **G700**: In the G700, Tests #6, 7, and 161 abort with Error Code 1412.

System technician-demanded tests: descriptions and error codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Battery Feed test (#35), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed test (#35)	X	X	ND
Station Present test (#48)	X	X	ND
Looparound test (#161) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Conference test (#7) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
NPE Crosstalk test (#6) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Station Status and Translation Audits and Updates test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

S8300 / **G700**: This test aborts with Error Code 1412.

This test verifies that the port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually part of the long test sequence and executes in about 20 to 30 seconds.

Table 110: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1000	ABORT	System resources are unavailable. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1001	ABORT	System resources required to run test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 110: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or have time slots out-of-service due to TDM-BUS errors. **1** Refer to TDM-BUS to diagnose any active TDM-BUS errors. **2** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors in the Error Log. **2** Resolve any TONE-PT errors in the Error Log. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	A valid call seized the port during the test and aborted the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1005	ABORT	This test was aborted due to a configuration problem. The test is not applicable for this type of analog port. This error can be ignored.
1018	ABORT	Administration has disabled the test. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application Test #48, which can be disturbing to customer or terminal equipment). **1** To enable the test for a particular station being tested, enter **change station *extension***. **2** Change the `Test` field on the station screen to **y**.
S8300 G700 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 110: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	System resources required to run test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
Any	FAIL	This test can fail due to either on- or off-board problems. Off-board problems include TDM-BUS faults, EXP-PN and EXP-INTF faults (**S8700 IP**: RMC-ENV faults), and faults associated with the Tone Detectors/Tone Generators. Clear every off-board problem before replacing the board. **1** A TDM-BUS problem is usually the result of a faulty board connection to the backplane, or bent pins on the backplane. Resolve any TDM-BUS errors in the error log. **2** Resolve any EXP-PN, EXP-INTF, or RMC-ENV errors in the error log. **3** Resolve any TONE-BD and/or TONE-PT errors in the error log. **4** Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. Investigate user-reported troubles on this port by running other port tests, by examining station wiring, or by inspecting the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to make sure that the board translations are correct. Use **list configuration** and resolve any problems. **2** If the board is correctly inserted, issue the **busy board** <***address***> command. **3** Issue **reset board** <***address***>. **4** Issue **release board** <***address***>. **5** Issue **test board** <***address***> **long**. This should re-establish the link between the internal ID and the port. If not, verify that a valid board is inserted.

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Conference Circuit Test (#7)

S8300 / **G700**: This test aborts with Error Code 1412.

This test verifies that the NPE channel for the port being tested correctly performs the conferencing function.

Table 111: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1000	ABORT	System resources are unavailable. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	A valid call seized the port during the test and aborted the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1005	ABORT	This test was aborted due to a configuration problem. The test is not applicable for this type of analog port. This error can be ignored.
1018	ABORT	Administration has disabled the test. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application Test #48, which can be disturbing to customer or terminal equipment). **1** To enable the test for a particular station being tested, enter **change station *extension***. **2** Change the `Test` field on the station screen to **y**.
S8300 G700 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Resolve any TONE-PT errors in the error log. **2** If there are no TONE-PT errors, retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, escalate the problem.

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Table 111: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. **1** Issue **display port *location*** and **status station *extension*** to determine whether the station is idle. **2** If the station is idle, issue **test port *location*** for this port. **3** If the test continues to fail, issue **busy port *location*** and **release port *location***, and then retest. **4** If the test still fails, replace the board.
	PASS	The port can correctly conference multiple connections. Investigate user-reported troubles on this port by running other port tests; by examining station, trunk, or external wiring; or by inspecting the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to make sure that the board translations are correct. Use **list configuration**, and resolve any problems. **2** If the board is correctly inserted, use **busy board <*address*>**. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the link between the internal ID and the port. If not, verify that a valid board is inserted.

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Battery Feed Test (or Port Diagnostic Test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery power, and detecting the resulting current.

Table 112: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

1 of 3

Table 112: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources are unavailable. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	A valid call seized the port during the test and aborted the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1005	ABORT	This test was aborted due to a configuration problem. The test is not applicable for this type of analog port. This error can be ignored.
1018	ABORT	Administration has disabled the test. The default for the `Test` field on the station form is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application Test #48, which can be disturbing to customer or terminal equipment). **1** To enable the test for a particular station being tested, enter **change station *extension***. **2** Change the `Test` field on the station screen to **y**.
1392	ABORT	This port is currently a TTI port and the test does not execute on it. **1** Verify that the port is a TTI port: • Enter the **display port *location*** command (the display shows that the port is a TTI port). • Enter the **list configuration** command (the display shows a `t` for the port). **2** If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary. **3** If either command indicates that the port is *not* a TTI port, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 112: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This test result might be marginal, and the terminal equipment may be operating satisfactorily. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack or media module only if the customer is experiencing problems.
	PASS	The port's battery feed chip is able to provide sufficient power to the station equipment to detect on-/off-hook, but may not be able to supply power for touch-tones. **1** If touch-tones are inoperative on this station, replace the circuit pack or media module, because this port is inoperative. **2** Investigate user-reported troubles on this port by running other port tests, by examining station wiring, or by inspecting the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to make sure that the board translations are correct. Use the **list configuration** command, and resolve any problems. **2** If the board is correctly inserted, issue the **busy board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the link between the internal ID and the port. If not, verify that a valid board is inserted.

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Station Status and Translation Audits and Updates Test (#36)

This test updates the analog port's message lamp state (if it has one) and translations with information in the software.

Table 113: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1004	ABORT	A valid call seized the port during the test and aborted the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1005	ABORT	This test was aborted due to a configuration problem. The test is not applicable for this type of analog port. This error can be ignored.
1006	ABORT	The port is out-of-service. The **busy station *extension*** has been given to this port. If the port is on a circuit pack, it may have been taken out-of-service by the failure of the NPE Crosstalk test. **1** Look for error type 18 (port busied out) for this port. If this error is present, release the port (**release station *extension***), and run the test again. **2** If the port is on a circuit pack, check for error type 1537 (NPE Crosstalk test failed) for this port. If this error is present, investigate the errors associated with the NPE Crosstalk test (#6). **3** Make sure that the terminal is connected and in service, and then retest.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1	FAIL	The switchhook audit failed. This result does not indicate a hardware problem. The other updates were not performed because of this failure. This may occur if the audit is performed at the same time the terminal equipment goes off-hook. **1** Use the **status station *extension*** command to determine when the port is available. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to fail, escalate the problem.
5	FAIL	The message waiting lamp update failed. This may be an internal software error. The translation and ringer updates were not performed because of this failure.

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Table 113: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
7	FAIL	The translation update failed. There may be an internal software error. The ringer update was not performed because of this failure.
8	FAIL	The ringer update failed. There may be an internal software error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
	PASS	The software and the port processor have the same status. Investigate user-reported troubles on this port by running other port tests, by examining station wiring, or by inspecting the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to make sure that the board translations are correct. Use the **list configuration** command, and resolve any problems. **2** If the board is correctly inserted, issue the **busy board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the link between the internal ID and the port. If not, verify that a valid board is inserted.

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Station Present Test (or Ringing Application Test) (#48)

This test applies momentary ringing voltage to the terminal equipment and monitors resulting current flow to determine whether terminal equipment is connected to the port. This test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, you can disable it via the `Tests` field on the **change station *extension*** screen. However, on some software releases, Tests #6, 7, 161, and 35 also are disabled.

S8300 / **G700**: In the G700, Tests #6, 7, and 161 abort with Error Code 1412.

Table 114: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 114: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources are unavailable. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	A valid call seized the port during the test and aborted the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1005	ABORT	This test was aborted due to a configuration problem. The test is not applicable for this type of analog port. This error can be ignored.
1008	ABORT	A ringing circuit could not be allocated. Either every ringing circuit is active, the ringing generator is defective, or it is incorrectly wired. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, look for RING-GEN errors in the Error Log. **3** If ABORT 1008 occurs for this test on other circuit packs as well, the ringing generator may be defective or is incorrectly wired (see RING-GEN (Analog Ring Generator) on page 1587. **4** If an ABORT 1008 does not occur on other ports, then all four ring phases are active.
1018	ABORT	Administration has disabled the test. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application Test 48, which can be disturbing to customer or terminal equipment). **1** To enable the test for a particular station being tested, enter **change station *extension***. **2** Change the `Test` field on the station screen to **y**.

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Table 114: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
	FAIL	The terminal equipment is not connected to the circuit pack. Some terminal equipment, such as modems, may fail even when connected properly. **1** Remotely test the terminal equipment. **2** If the test fails again, resolve any RING-GEN errors in the error log, if present. **3** Check all of the wiring between the station equipment and the switch. Then, run the test again. **4** If the test still fails, the terminal equipment may be defective. Check and replace it, if necessary. **5** Some terminal equipment might fail even when it is connected properly. If this is the case, disable the test using **change station *extension*** (enter **n** into the `Test` field). Note that this action also disables Tests 6, 7, 35, and 161 on this port.
	PASS	The station is connected properly to the switch. Investigate user-reported troubles on this port by running other port tests, by examining station wiring, or by inspecting the station. **NOTE:** This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to make sure that the board translations are correct. Use the **list configuration** command, and resolve any problems. **2** If the board is correctly inserted, issue the **busy board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the link between the internal ID and the port. If not, verify that a valid board is inserted.

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Loop-Around Test (#161)

S8300 / **G700**: This test aborts with Error Code 1412.

This test checks the on-board transmission capabilities of the NPE, the codec, and the battery feed chip of the analog port. The test passes if the signal measured by the Tone Detector is within acceptable limits.

Table 115: Test #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Necessary system resources could not be allocated to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1000	ABORT	System resources are unavailable. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *location*** to determine the station's extension. **2** Enter **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or have time slots out-of-service due to TDM-BUS errors. **1** Refer to "TDM-BUS" to diagnose any active TDM-BUS errors. **2** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors in the Error Log. **2** Resolve any TONE-PT errors in the Error Log. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.

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Table 115: Test #161 Loop-Around Test *Continued*

Error Code	Test Result	Description / Recommendation
1004	ABORT	A valid call seized the port during the test and aborted the test. **1** Use **display port *location*** to determine the station extension. **2** Use **status station *extension*** to determine the service state of the port. **3** If the port is active, wait until it is idle before testing. Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1005	ABORT	This test was aborted due to a configuration problem. The test is not applicable for this type of analog port. This error can be ignored.
1018	ABORT	Administration has disabled the test. The default for the `Test` field on the station screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the ringing application Test 48, which can be disturbing to customer or terminal equipment). **1** To enable the test for a particular station being tested, enter **change station *extension***. **2** Change the `Test` field on the station screen to **y**.
S8300 G700 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
	FAIL	The reflective loop-around test failed. This could cause noisy or unreliable connections, or users calling this port may hear an echo. The problem can also be off-board. **1** Since a line seizure may affect the test, repeat the test at 1-minute intervals up to 5 times. **2** Using the **test board *location* short** command, run circuit pack tests to check the Tone Generator and the Tone Detector circuits on the IPSIs or the Tone Generator/Tone Detector circuit packs. **3** Resolve any problems on the Tone Generator or the Tone Detector circuit. **4** If the Tone Generator and Tone Detector circuits are functioning properly, determine whether a voice terminal is connected and wired properly. Resolve any problems found. **5** If the test still fails, replace the analog line circuit pack.

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Table 115: Test #161 Loop-Around Test *Continued*

Error Code	Test Result	Description / Recommendation
	PASS	The port provides an analog transmission path to the station equipment. Investigate user-reported troubles on this port by running other port tests, by examining station wiring, or by inspecting the station.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to make sure that the board translations are correct. Use the **list configuration** command, and resolve any problems. **2** If the board is correctly inserted, issue the **busy board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the link between the internal ID and the port. If not, verify that a valid board is inserted.

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ANN-BD (announcement circuit pack)

S8100 only

MO name (in alarm log)	Alarm level	Initial command to run[1]	Full name of MO
ANN-BD	MINOR	**test board *location* l**	Announcement Circuit Pack
ANN-BD	WRN	**test board *location* l**	Announcement Circuit Pack

1 For information on specifying a location, see Command Syntax on page 179.

NOTE:
The information contained in this MO refers only to the TN750-series of circuit packs. Expressions such as "announcement circuit pack" and "announcement board" are to be interpreted to mean the TN750-series only.

The TN750 Announcement circuit pack is a service circuit which provides an integrated means for recording announcements that can be played back on demand by call processing as part of a calling feature (for example, announcements on hunt group calls). There are 16 Announcement Ports on the Announcement circuit pack. Each port can play any integrated announcement, independently of the other ports. In addition to the 16 Announcement Ports, the Announcement circuit pack also has one Data Line Circuit Port (port 17). The Data Line Circuit Port is used for uploading/downloading the announcement memory to/from the memory card. If there are any errors associated with port 17, refer to DAT-LINE (Data Line Port) on page 669. If there are any errors associated with any other port, refer to ANN-PT (announcement port) on page 316.

NOTE:
TN750C is required if your system has multiple announcement boards (up to ten are allowed). Only one TN750A/B may be present in the system when a TN750C is used. The announcements from a TN750A/B can be saved and restored to a TN750C — but once the announcements are recorded onto a TN750C, they are not backward compatible with the TN750A/B.

The Announcement circuit pack has two processors on it. The first processor, or Angel, controls the circuit pack and communicates with the switch via the control channel on the TDM Bus. The second processor, or Speech Processor (SP), controls the speech memory and announcements. Digital speech is converted from its TDM Bus form to an internal storage form (for recording) and vice versa (for playbacks) by the 140AY device on the circuit pack, which has 16 channels (one for each Announcement Port).

General notes

Here are a few **very important** general notes that apply to any problem on the Announcement circuit pack. The user should read this before attempting to work on the TN750 Announcement circuit pack or Announcement Ports, **especially if the circuit pack needs to be replaced.**

1 The TN750 Announcement circuit pack retains all integrated announcements *as long as the circuit pack has power.* For this reason, whenever there is a problem with either the Announcement circuit pack or an Announcement Port that may require the circuit pack to be

reset, it is always best to try to reset the circuit pack via the **reset board PCSS** command first. If that does not work, replace the circuit pack. **Announcements are preserved through a software reset, but they are lost when the circuit pack is reseated.**

2 **If a customer has announcements on the Announcement circuit pack, then announcements must be saved on the memory card to ensure that they are not lost.** This should be done as soon as the announcements are recorded on the circuit pack (or whenever they are changed), assuming that the circuit pack is in proper working order (see Note).

> **NOTE:**
> Unlike translations, announcements are NEVER automatically saved to the memory card.

3 The **save announcements** command replaces the announcement file on the memory card. Care must be taken not to mistakenly enter this command and, as a result, destroy a valid file on the memory card.

4 The **restore announcements** command replaces the Announcement circuit pack speech memory with the announcement file on the memory card. Care must be taken not to mistakenly enter this command, destroying valid speech memory, especially if the memory card does not have a valid announcement file on it.

5 Whenever the Announcement circuit pack is replaced, announcements must always be rerecorded or downloaded to the new circuit pack. Otherwise, call processing is not able to use the pack.

6 If announcement speech memory is corrupted, announcements should not be saved [that is, if the Announcement Checksum Test (#209) fails, or if the speech sounds corrupted on playback]. This can ruin a good announcement file on the memory card and potentially cause errors/alarms on any circuit pack to which the new file is downloaded. However, if the customer does not have a valid announcement file on the memory card, announcements can be saved in an effort to try to retain some of them (all of the announcements recorded may not be corrupted).

7 Due to a hardware fault in the TN750 announcement board, the following sequence of events may cause the announcement file to become corrupted and unusable:

- **a** Fill the board with recorded announcements.
- **b** Delete the last few announcements recorded.
- **c** Re-record the announcements deleted.

If the announcement file becomes corrupted, the only solution is to re-record all announcements. To do this, follow these steps:

- **a** Remove the announcement board.
- **b** Remove the tape cartridge from the tape drive. Do this so that announcements are not automatically restored from tape.
- **c** Re-insert the announcement board.
- **d** Re-record all announcements.
- **e** Insert the tape cartridge in the tape drive.
- **f** Issue the save announcements command to save all the announcements on the tape.

This hardware fault is fixed in the TN750B announcement board. However, the TN750B board will not automatically correct an announcement file which has previously been corrupted by a TN750 board. The only way to correct an announcement file corrupted by the TN750 board is to follow the steps above.

Announcement administration

A brief description of the integrated announcement administration is given here to aid in troubleshooting the Announcement circuit pack and its ports. In many cases, it is necessary to record, play back, and/or delete announcements to resolve an alarm. It may also be necessary to save and restore announcements as part of the maintenance procedures. For a complete description of integrated announcement administration, please refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506*.

Announcement session

Announcements can be recorded, played back, and deleted from an announcement session. A station's COS needs to include console permissions in order for that station to be able to enter an announcement session. To enter an announcement session, go off-hook on a station that has console permissions and enter the appropriate Feature Access Code (FAC), administered as Announcement access code on the FACs form. Dial tone should be returned at this point. Enter the extension of the announcement that needs to be recorded, deleted, or played back. Again, dial tone should be heard. To record an announcement, press station keypad digit 1, record after the tone, and hang up when done. To play back an announcement, press 2. To delete an announcement, press 3 (confirmation tone is given if the delete worked). Announcements can also be played back by simply calling the announcement extension associated with them.

Uploading/Downloading announcements

Integrated announcements on the TN750 Announcement circuit pack can be uploaded to the memory card with the administration terminal **save announcements** command. Likewise, integrated announcements can be downloaded to the Announcement circuit pack with the **restore announcements** command. Both of these commands require a free data module of NETCON type to be administered, a data module of announcement type (on the Announcement circuit pack) to be administered, and a memory card. These commands are useful in maintaining the customer's recorded announcements. Depending on system traffic, announcement uploads and/or downloads take between 30 and 45 minutes.

The system **automatically** tries to download the Announcement circuit pack five minutes after it is inserted. This automatic download procedure is aborted if:

- An announcement is recorded within 10 minutes of circuit pack insertion.
- An announcement download is invoked sooner with the administration terminal **restore announcements** command.
- No announcement and/or NETCON data module is administered.
- Either the announcement data module is busy or all the administered NETCON data modules are busy.
- No memory card is in the system.
- The memory card in the system does not have a valid announcement file saved on it.

Hardware error log entries and test to clear values

Table 116: Announcement circuit pack error log entries

Error type	Aux data	Associated test	Alarm level (See WARNING message below)	On/Off board	Test to clear value
0[1]	0	Any	Any	Any	test board PCSS sh r 1
1 (a)	0	Circuit pack removed or SAKI Test (#53)	MINOR	ON	
2 (p)		None			
14 (b)	1 to 64	Announcement Checksum Test (#209)			
18	0	busyout board PCSS	WARNING	OFF	release board PCSS
23 (c)	0	None	WARNING	OFF	
125 (d)		None	MINOR	ON	
170 (e)	0	None	MINOR	ON	
217 (f)	0	None	WARNING	OFF	
257	65535	Control Channel Test (#52)	MINOR	ON	test board PCSS l r 20
257 (g)	Any	None			
267 (f)	0	None	WARNING	OFF	
513 (h)	Any	None			
1025 (i)	4363	NPE Audit Test (#50)			test board PCSS l
1281 (j)	17699	None			
1538 (k)	Any	None	MINOR	ON	
1793		Angel-SP Handshake Test (#208)	MINOR	ON	test board PCSS l r 3
	17680	In-line Error			
2049 (l) (m)		Clock Match Inquiry Test (#212)	MINOR	ON	test board PCSS sh r 3
	17674	In-line Error			
2305		140AY Loop Around Test (#210)	MINOR	ON	test board PCSS sh r 3
2561		Super Frame Match Inquiry Test (#211)	MINOR	ON	test board PCSS sh r 3

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Table 116: Announcement circuit pack error log entries

Error type	Aux data	Associated test	Alarm level (See WARNING message below)	On/Off board	Test to clear value
	17676	In-line Error			
2817 (l)		Announcement Checksum Test (#209)	MINOR	ON	test board PCSS sh r 3
	17682	In-line Error			
	17699 (m)	In-line Error			
3840 (n)	Any	None			
3999 (o)	Any	None			

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1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

WARNING:
All alarms are upgraded to MAJOR when the BASE Tone Generator is set to 12 (France).

Notes:

a Error Type 1— This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

NOTE:
The alarm is logged about 11 minutes after the circuit pack has been removed and/or SAKI Test (#53) fails.

If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, follow the instructions for "Red (alarm)" in Circuit pack status LEDs on page 53.

NOTE:
The alarm is logged about 11 minutes after the circuit pack has been removed and/or SAKI Test (#53) fails.

WARNING:
Reseating and/or replacing the circuit pack results in loss of integrated announcements (TN750/B only). See General notes on page 316 near the beginning of this Maintenance procedure.

b Error Type 14— Whenever the Announcement Checksum Test (#209) fails, this error is logged. The Aux Data indicates the number of the first defective announcement found. This number corresponds to the announcement numbers on the announcement form. The extension relating to the announcement can be determined by the **display announcement** command. This error only appears in the Error Log in conjunction with Error Type 2817. Follow the procedures for Error Type 2817 to troubleshoot Error Type 14.

c Error Type 23—The circuit pack has been logically administered but not physically installed. The alarm is cleared when the circuit pack is installed.

d Error Type 125—A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either remove the wrong circuit pack and insert the logically administered circuit pack OR use the **change circuit-pack** command to readminister this slot to match the circuit pack inserted.

e Error Type 217 and 267— Indicate that there is more than one TN750 Announcement circuit pack inserted in the system. Remove the alarmed circuit pack.

f Error Type 257—This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

g Error Type 513—This error, when reported with Aux Data in the range of 4352 to 4358, indicates the circuit pack has reported a hardware failure on the circuit pack. The circuit pack should be replaced.

WARNING:
Replacing the circuit pack results in loss of integrated announcements (TN750/B only). See General notes on page 316 near the beginning of this Maintenance procedure.

h Error Type 1025—This error is not service-affecting and no action is required.

i Error Type 1281—The SP found a fault in the speech main memory (SMM) (that is, it found one or more faulty memory locations). Whenever this error is logged, error 2817 is also logged [see Note (j)], which causes the maintenance system to run the Announcement Checksum Test (#209) to determine if the bad memory location was being used by an announcement.

j Error Type 1538—The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

1. The tests run on the ports of this circuit pack are returning with a NO-BOARD.
2. A busyout/release of the circuit pack has no effect on test results.
3. A **list configuration** command shows that the circuit pack and ports are properly installed.

The system tries to restore the circuit pack within 15 minutes. If the error recurs after 15 minutes, replace the circuit pack. (Refer to Reseating and replacing circuit packs in Maintenance Procedures (555-245-103).)

k Error Type 2049 and 2817—These errors are logged in conjunction with Error Type 1281, Aux Data 17699. Since that error [see Note (i)] means that a defective speech memory location was found, the announcement checksum error is also logged. This causes the Announcement Checksum Test (#209) to run, which determines if the defective memory location has corrupted any recorded announcements. If the Checksum Test passes, the faulty memory location is currently not being used, and the SP marks the location as faulty to ensure that future announcements do not attempt to use it.

NOTE:
As memory locations are marked faulty, the amount of available memory decreases, which decreases the total amount of announcement time available on the circuit pack.

l Error Type 2049—A transient error that does not cause an alarm can occasionally occur during a SPE, TDM BUS, or Tone Clock interchange. It is possible for a marginal Tone-Clock circuit pack to cause this error against the ANN-BD without alarming the TONE-BD. If this error occurs again, replacing the Tone-Clock circuit pack may clear up this error. See the FAIL case in the Clock Match Inquiry Test (#212).

m Error Type 3840— This error is not service-affecting and no action is required.

n Error type 3999— Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

o Error Type 2—Check the Class of Restriction (COR) administered for the Data Line extension assigned to the TN750 for uploading and downloading announcements. The extension can be found by using **list data-module**.

System technician-demanded tests: descriptions and error codes

Always investigate tests in the order presented in Table 117, System Technician-demanded tests: ANN-BD, on page 306 when inspecting errors in the system. By clearing error codes associated with the *Control Channel Loop Around Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Table 117: System Technician-demanded tests: ANN-BD

Order of investigation	Short test sequence	Long test sequence	Reset board sequence	D/ND[1]
Control channel loop-around test (#52) (a)		X		ND
Angel-speech processor (sp) handshake test (#208)		X		ND
Clock match inquiry test (#212)	X	X		ND
Super frame match inquiry test (#211)	X	X		ND
140AY loop around test (#210)	X	X		ND
Announcement checksum test (#209)	X	X		ND
Connection Audit Test (#50) (a)		X		ND
SAKI Sanity Test (#53) (a)			X	D

1 D = Destructive, ND = Nondestructive

Note:

a For a complete description of these tests, refer to the XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

Angel-speech processor (sp) handshake test (#208)

This test checks the integrity of the communication link between the two processors on the Announcement circuit pack.

WARNING:
Failure of this test indicates that the Speech Processor is insane and ***results in the loss of all integrated announcements on the circuit pack.***

Table 118: TEST #208 angel-speech processor (SP) handshake test

Error code	Test result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	Test failed. Circuit pack cannot be used. **Announcement speech memory is cleared when this test fails. Therefore, when the problem has been resolved, announcements must be rerecorded or downloaded to the circuit pack.** **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack and then run this test again. **2** If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack **even if Step 1 works**. **WARNING:** Replacing the circuit pack results in loss of integrated announcements. See General notes on page 316.
	PASS	The communications link between the two processors on the Announcement circuit pack is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to ANN-PT (announcement port) on page 316 for a description of the port tests.

Announcement checksum test (#209)

Associated with every recorded announcement is a checksum. In this test, the SP checks a stored global checksum covering all recorded announcements against a calculated one and returns the results to the maintenance system. If the global checksum failed, maintenance requests the SP to check each individual announcement's checksum.

If the test fails, then it returns the total number of defective announcements found. In addition, associated with each failure is an error in the Error Log (Error Type 14). The Aux Data indicates the number of the first defective announcement found. This number corresponds to the announcement numbers on the announcement form. The extension relating to the announcement can be determined by the **display announcement** command.

Table 119: TEST #209 announcement checksum test

Error code	Test result	Description/ Recommendation
0	ABORT	An error code of 0 indicates that the announcement file has been corrupted due to a hardware fault in the TN750 board. Follow step #7 under General notes on page 316 at the beginning of this section.
1023	ABORT	There are no announcements currently recorded on the circuit pack.
1024	ABORT	This abort code is given for the following reasons: **1** An announcement upload or download is in progress. **2** An announcement upload or download is requested when this test is running. **3** A record is in progress. **4** A record request comes in when this test is running. If an announcement upload or download is in progress, a **status data-module <announcement data extension>** command should show that the announcement data port is connected to a NETCON data channel, and the "card-in-use" LED for the memory card is on (to determine the extension of the announcement data module, use the **list data-module** command). See Note (a) at end of table for more information. **1** Wait until the blocking event is finished, and then run this test again. An upload or download could take up to 45 minutes to complete, and a recording session is finished as soon as the station that was making the recording is placed on-hook. **2** If the test continues to abort, and a record or upload/download is not in progress, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.

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Table 119: TEST #209 announcement checksum test

Error code	Test result	Description/ Recommendation
0-256	FAIL	Test failed. The error code indicates the total number of defective announcements that were found. When TEST #209 fails with error code 0, the Global Checksum failed on the board, but no individual Checksum failed. **NOTE:** Since the announcements are recorded digitally, it is possible for the Announcement Checksum Test to *fail* but still have all the announcements sound uncorrupted. When an individual announcement fails the Checksum Test, always listen to the announcement first before taking any action (an announcement can be played back by dialing the announcement extension associated with the announcement number). If the announcement sounds corrupted, then rerecord it or delete it. **1** Look in the Error Log to determine the number of the first defective announcement. Play back the announcement. If the announcement sounds defective, rerecord it or delete it. If the error code was greater than one (indicating that there is more than one defective announcement), run this test again and repeat this step. **2** If after deleting and rerecording all defective announcements, the checksum test still fails, reset the circuit pack using the **reset board PCSS** command and run this test again. **3** If the test still continues to fail, reseat the circuit pack and restore all announcements with an appropriate time estimate (for example, 40 minutes.) Then rerecord the lost announcements (that is, those recorded since the last save operation) and run this test again. **4** If the test still continues to fail, replace the circuit pack, and run this test again. **WARNING:** Replacing the circuit pack results in loss of integrated announcements. See General notes on page 316 near the beginning of this Maintenance procedure.
	PASS	All recorded announcements checksum correctly, indicating that the speech main memory is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to ANN-PT (announcement port) on page 316 Maintenance documentation for a description of the port tests.

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Notes:

a The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack will be unusable by software, one of which is the record port. Also, **save/restore announcements** will not work, since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this, and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement do not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yield the following abort codes:
   - Ports 1 AND 9 abort Test #206 with code 1024
   - Ports 1 AND 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   ```
   Error encountered, can't complete request
   ```

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- Reset circuit pack using the **reset board PCSS** command
- Release circuit pack using the **release board PCSS** command

140AY loop around test (#210)

This test checks the integrity of the record channel on the Announcement circuit pack (Announcement Port 1). The main function of the 140AY device is to accept Pulse Code Modulation (PCM)/Adaptive Differential Pulse Code Modulation (ADPCM) samples and compress/expand the samples using ADPCM. This test connects a Tone Generator to one port (Announcement Port 1, the recording port), and a Tone Detector to another port (Announcement Port 9). A tone is generated by the Tone Generator on the first port and looped through the 140AY device to the second port. The Tone Detector then responds with a tone present/absent message. The 140AY Loop Around Test is repeated at three different speech compression rates.

Since this test involves sending a tone through two different ports, the Playback Speech Memory Array (PSMA) Test (#206) is run on the two ports first to make sure that they are working properly. See ANN-PT (announcement port) on page 316 for a description of this test.

Table 120: TEST #210 140AY loop around test

Error code	Test result	Description/ Recommendation
1-3	ABORT	Response to the test request was not received within the allowable time period. The error code indicates at which speech compression rate the test aborted (one being the first rate tested, three being the last). **1** Retry the command at 1-minute intervals a maximum of 5 times.
10	ABORT	The PSMA Test (#206) failed on Announcement Port 1.
90	ABORT	The PSMA Test (#206) failed on Announcement Port 9. **1** Refer to ANN-PT (announcement port) on page 316 Maintenance documentation, Test #206.
1000	ABORT	System resources required to run this test are not available. This test needs Announcement Ports 1 and 9 to run. One of the ports may be in use on a valid call. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to abort and Ports 1 and 9 are not in use, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) on page 1832 Maintenance documentation to diagnose any active TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals a maximum of 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Look for TTR-LEV errors in the Error Log. If present, refer to the TTR-LEV (TTR Level) on page 1946. **2** Look for TONE-PT errors in the Error Log. If present, refer to the TONE-PT (Tone Generator) on page 1927. **3** If neither condition exists, retry the test at 1-minute intervals a maximum of 5 times.
1007	ABORT	The Announcement circuit pack thinks that Port 1 or Port 9 is busy. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to abort, follow the Announcement Port maintenance procedures for Ports 1 and 9.

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Table 120: TEST #210 140AY loop around test

Error code	Test result	Description/ Recommendation
1024	ABORT	Announcement circuit pack blocked the test because an announcement download is in progress. If an announcement download is in progress, a **status data-module <announcement data extension>** command should show that the announcement data port is connected to a NETCON data channel, and the "card-in-use" LED for the memory card should be on (to determine the extension of the announcement data module, use the **list data-module** command). See Note (a) at end of table for more information. **1** Wait until download is finished (can take up to 45 minutes), and then run the test again. **2** If the test continues to abort and there is no download in progress, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this error type. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2007	ABORT	The Announcement circuit pack thinks that Port 1 or Port 9 is busy. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to abort, follow the Announcement Port maintenance procedures for Ports 1 and 9.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1-3	FAIL	Test failed. The error code indicates at which speech compression rate the test actually failed (one being the first rate tested, three being the last). **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test still fails, replace the circuit pack (see Warning) and run this test again. **2** If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** Replacing the circuit pack results in loss of integrated announcements. See General notes on page 316 on page -92.
	PASS	The record channel on the Announcement circuit pack is functioning properly. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to ANN-PT (announcement port) on page 316 on page -108 for a description of the port tests.

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Notes:

a The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack will be unusable by software, one of which is the record port. Also, **save/restore announcements** will not work since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this, and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement does not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yields the following abort codes:
   - Ports 1 AND 9 abort Test #206 with code 1024
   - Ports 1 AND 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   ```
   Error encountered, can't complete request
   ```

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- Reset circuit pack using the **reset board PCSS** command
- Release circuit pack using the **release board PCSS** command

Super frame match inquiry test (#211)

The super frame is a means by which the SP synchronizes with the 140AY device on the Announcement circuit pack. If the super frame is not synchronized, the SP is not able to properly process record/playback requests. Both the SP and the hardware generate a super frame pulse. When these two pulses are out of synch, the SP sets a flag to indicate the mismatch. When this test is run, the state of this flag is returned.

Table 121: TEST #211 super frame match inquiry

Error code	Test result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.

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Table 121: TEST #211 super frame match inquiry *Continued*

Error code	Test result	Description/ Recommendation
	FAIL	Test failed. Announcement playbacks should sound corrupted. **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). **2** If there are recurring alarms on this circuit pack caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** Replacing the circuit pack results in loss of integrated announcements. See General notes on page 316 near the beginning of this Maintenance procedure.
	PASS	The SP can properly process record/playback requests. User-reported troubles on this circuit pack should be investigated using other circuit pack and port tests. Refer to ANN-PT (announcement port) on page 316 for a description of the port tests.

Clock match inquiry test (#212)

This test is supported to determine the state of the clock generation circuitry on the Announcement circuit pack. This circuitry is used for controlling various pieces of the hardware, like the 140AY device. It is also used to synchronize the Announcement circuit pack with the clock that is on the backplane.

Table 122: TEST #212 clock match inquiry test

Error code	Test result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this Error Type.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.

Table 122: TEST #212 clock match inquiry test

Error code	Test result	Description/ Recommendation
	FAIL	Test failed. Announcements recorded or played back while the clock circuitry is not functioning properly sound distorted. The ANN-BD may be defective or the Active Tone-Clock circuit pack (TONE-BD) may be marginal and is causing this test to fail. **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, proceed to Step 2 or 3 as applicable. **WARNING:** Replacing the circuit pack results in loss of integrated announcements. See General notes on page 316 near the beginning of this Maintenance procedure.
	FAIL *(cont'd.)*	**2** Replace the ANN-BD. Rerun the test. If the test continues to fail, replace the Tone-Clock circuit pack. **WARNING:** Replacing the TONE-BD causes a COLD 2 reset. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911. Replacing the ANN-BD results in loss of integrated announcements. See General notes on page 316 near the beginning of this Maintenance procedure. **3** If there are recurring alarms on this circuit pack caused by this test failing, replace the ANN-BD even if the previous steps were successful.
	PASS	Announcement record/playbacks should have clear sound quality. User-reported troubles on this circuit pack should be investigated using other circuit packs and port tests. Refer to ANN-PT (announcement port) on page 316 for a description of the port tests.

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ANN-PT (announcement port)

S8100 only

MO name (in alarm log)	Alarm level	Initial command to run[1]	Full name of MO
ANN-PT	MINOR	**test port *location* l**	Announcement Port
ANN-PT	WRN	**test port *location* l**	Announcement Port

1 For information on specifying a location, see Command Syntax on page 179.

The TN750 Announcement circuit pack is a service circuit pack that provides an integrated means for recording announcements that can be played back on demand by call processing as part of a calling feature (that is, announcements on hunt group calls). There are 16 Announcement Ports on the Announcement circuit pack. Each port can play any integrated announcement, independently of the other ports. If there are any errors associated with the circuit pack, refer to ANN-BD (announcement circuit pack) on page 299.

The Announcement circuit pack has two processors on it. The first processor, or Angel, controls the circuit pack, and communicates with the switch via the control channel on the TDM Bus. The second processor, or SP, controls the speech memory and announcements. Digital speech is converted from its TDM Bus form to an internal storage form (for recording) and vice versa (for playbacks) by the 140AY device on the circuit pack, which has 16 channels (one for each Announcement Port).

General notes

Here are a few **very important** general notes that apply to any problem on the Announcement circuit pack. The user should read this before attempting to work on the TN750 Announcement circuit pack or Announcement Ports, **especially if the circuit pack needs to be replaced.**

1. The TN750/B Announcement circuit pack retains all integrated announcements *as long as the circuit pack has power.* For this reason, whenever there is a problem with either the Announcement circuit pack or an Announcement Port that may require the circuit pack to be reset, it is always better to try to reset the circuit pack via the **reset board PCSS** command first and, if that does not work, then try to reseat it. **Announcements are preserved through a software reset, but they are lost when the circuit pack is reseated.**
2. **If a customer has announcements on the Announcement circuit pack, then announcements must be saved on the system tape to ensure that they are not lost.** This should be done as soon as the announcements are recorded on the circuit pack (or whenever they are changed), assuming that the pack is in proper working order (see Note).

   NOTE:
   Unlike translations, announcements are NEVER automatically saved to the memory card.

3. The **save announcements** command replaces the announcement file on the card with the Announcement circuit pack speech memory. Care must be taken not to mistakenly enter this command, thereby destroying a valid file on tape.

4 The **restore announcements** command replaces the Announcement circuit pack speech memory with the announcement file on the card. Care must be taken not to mistakenly enter this command, thereby destroying valid speech memory (especially if the card does not have a valid announcement file on it).

5 Whenever the Announcement circuit pack is replaced, announcements must always be re-recorded or downloaded to the new circuit pack. Otherwise, call processing is not able to use the circuit pack.

6 If announcement speech memory is corrupted, **announcements should not be saved**, that is, if the Announcement Checksum Test (#209) fails or if the speech sounds corrupted on playback. This can ruin a good announcement file and potentially cause errors/alarms on any circuit pack to which the new file is downloaded. However, if the customer does not have a valid announcement file, then announcements can be saved in an effort to try to retain some of them (all of the announcements recorded may not be corrupted).

7 Although Announcement Port 5 and Data Line Circuit Port 17 on the Announcement circuit pack are logically two separate ports, they are physically the same port. Therefore, if one of the ports is in use, the other one will be busy. Also, if Announcement Port 5 is out-of-service, the Data Line Circuit Port is taken out-of-service. However, if the Data Line Circuit Port is out-of-service, the Announcement Port remains in-service.

Announcement administration

A brief description of the integrated announcement administration is given here to aid in the troubleshooting of the Announcement circuit pack and its ports. In many cases, it is necessary to record, play back, and/or delete announcements to resolve an alarm. It may also be necessary to save and restore announcements as part of the maintenance procedures. For a complete description of integrated announcement administration, please refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506*.

Announcement session

Announcements can be recorded, played back, and deleted from an announcement session. A station's COS needs to include console permissions in order for that station to be able to enter an announcement session. To enter an announcement session, go off-hook on a station that has console permissions and enter the appropriate FAC (administered as Announcement access code on the FACs form). Dial tone should be returned at this point. Enter the extension of the announcement that needs to be recorded, deleted or played back. Again, dial tone should be heard. To record an announcement, press station keypad digit 1, record after the tone, and hang up when done. To play back an announcement, press station keypad digit 2. To delete an announcement, press station keypad digit 3 (confirmation tone is given if the delete worked). Announcements can also be played back by simply calling the announcement extension associated with them.

Uploading/Downloading announcements

Integrated announcements on the TN750 Announcement circuit pack can be uploaded to the memory card with the **save announcements** command. Similarly, integrated announcements can be downloaded to the Announcement circuit pack with the **restore announcements** command. Both of these commands require a free data module of NETCON type to be administered, a data module of

announcement type (on the Announcement circuit pack) to be administered, and a memory card. These commands are useful in maintaining the customer's recorded announcements. Depending on system traffic, announcement uploads/downloads take between 30 and 45 minutes.

The system **automatically** tries to download the Announcement circuit pack five minutes after it is inserted. This automatic download procedure is aborted if:

- An announcement is recorded within 10 minutes of circuit pack insertion.
- An announcement download is invoked sooner with the administration terminal **restore announcements** command.
- There is no announcement and/or NETCON data module administered.
- Either the announcement data module is busy or all the administered NETCON data modules are busy.
- There is no memory card in the system.
- The memory card in the system does not have a valid announcement file saved on it.

> **NOTE:**
> Unlike translations, there is no provision in the system for automatically saving announcements to the memory card.

Announcement Board Locked Condition

The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the announcement ports on the circuit pack (one of which is the record port) will be unusable by software. Also, **save/restore announcements** will not work since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this and will attempt to use the ports.

If the circuit pack is locked into this state, the following symptoms will be observed:

1. When attempting to record an announcement, users will hear the proper record tone, but the announcement will not record (they will not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state will yield the following abort codes:
   - Ports 1 AND 9 abort Test 206 with code 1024.
   - Ports 1 AND 9 abort Test 205 with code 2000.
   - Board-level Tests 209 and 210 abort with code 1024.
3. The **save/restore announcements** command will time out with:

   ```
   Error encountered, can't complete request
   ```

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board *UUCSS*** (this command drops every call in progress on the Announcement circuit pack).
- Reset circuit pack using the **reset board *UUCSS*** command.
- Release board using the **release board *UUCSS*** command.

Hardware error log entries and test to clear values

Table 123: Announcement port error log entries

Error type	Aux data	Associated test	Alarm level	On/Off board	Test to clear value
0[1]	0	Any	Any	Any	test port PCSSpp sh r 1
1		Playback Speech Memory Array (PSMA) Test (#206)	MINOR	ON	test port PCSSpp sh r 3
18	0	The port was busied out	WARNING	OFF	release port PCSSpp
130 (a)		None	WARNING	ON	test port PCSSpp sh
257		Channel Administration Memory Array (CAMA) Test (#205)	MINOR	ON	test port PCSSpp l r 3
	17667	In-line error			
513		140AY Channel Sanity Inquiry Test (#222)	MINOR	ON	test port PCSSpp sh r 3
	17684	In-line error			
769 (b)		None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

b This error is logged and the port is alarmed when an alarm is raised on the Announcement circuit pack because of a faulty condition with a common circuit pack resource. Any one of the following alarmed errors on the Announcement circuit pack causes this error to be logged against the Announcement Port: 1793, 2049, 2305, 2561. Follow the ANN-BD (announcement circuit pack) Maintenance documentation to resolve these alarms. When the corresponding circuit pack alarm is cleared, this alarm clears.

System technician-demanded tests: descriptions and error codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Channel Administration Memory Array (CAMA) Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Table 124: Announcement port system technician-demanded tests

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Channel administration memory array (cama) test (#205)		X	ND
Playback speech memory array (PSMA) test (#206)	X	X	ND
140AY channel sanity inquiry test (#222)	X	X	ND

1 D = Destructive; ND = Nondestructive

Channel administration memory array (cama) test (#205)

This test is a memory device that stores information used to control the 140AY device. The Angel asynchronously feeds the CAMA with the control information. During the CAMA test, the Angel writes patterns into the CAMA, reads them back, and verifies that they match. If the patterns do not match, the test fails. This test is run periodically by the switch maintenance and by the Announcement circuit pack in the background.

Table 125: TEST #205 channel administration memory array (CAMA) test

Error code	Test result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. See Note (a) at end of table for more information.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	Test failed. Announcements played back on this port may sound corrupted. **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). **2** If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** Replacing the circuit pack results in loss of integrated announcements. Refer to General notes on page 316.

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Table 125: TEST #205 channel administration memory array (CAMA) test

Error code	Test result	Description/ Recommendation
	PASS	This test verifies that the Angel processor can properly set up this port for playbacks. User-reported troubles on this circuit pack should be investigated using other port and circuit pack tests. (Refer to ANN-BD (announcement circuit pack) on page 299 for a description of the circuit pack tests.)

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Notes:

a The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack (one of which is the record port) will be unusable by software. Also, **save/restore announcements** will not work since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement does not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yields the following abort codes:
   - Ports 1 AND 9 abort Test #206 with code 1024
   - Ports 1 AND 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   Error encountered, can't complete request

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- Reset circuit pack using the **reset board PCSS** command
- Release circuit pack using the **release board PCSS** command

Playback speech memory array (PSMA) test (#206)

The PSMA test checks the integrity of a playback channel's interface to the speech memory and the TDM Bus. The SP has an internal buffer that contains a specific 256-byte sequence. During this test, the byte sequence is "played" through the 140AY device onto the TDM Bus. A General Purpose Tone Detector is used to confirm that the proper sequence was played. **This test is very important.** It is the only test that actually checks an Announcement Port's ability to play back an announcement on the TDM Bus. If the test fails, the Tone Detector returns the number of bytes that did not match the expected sequence.

The larger the number, the more severe the problem with that port. If this test fails, announcements played over this port should sound corrupted.

It is the only test that actually checks an Announcement Port's ability to play back an announcement on the TDM Bus. If the test fails, the Tone Detector returns the number of bytes that did not match the expected sequence. The larger the number, the more severe the problem with that port. If this test fails, announcements played over this port should sound corrupted.

Table 126: TEST #206 playback speech memory array (PSMA) test

Error code	Test result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) on page 1832 to diagnose any active TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals a maximum of 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Look for TTR-LEV errors in the Error Log. If present, refer to TTR-LEV (TTR Level) on page 1946. **2** Look for TONE-PT errors in the Error Log. If present, refer to TONE-PT (Tone Generator) on page 1927. **3** If neither condition exists, retry the test at 1-minute intervals a maximum of 5 times.
1024	ABORT	Announcement circuit pack blocked the test because an announcement download is in progress. If an announcement download is in progress, a **status data-module <announcement data extension>** command should show that the announcement data port is connected to a NETCON data channel, and the memory card should be active. (To determine the extension of the announcement data module, use the **list data-module** command.) See Note (a) at end of table for more information. **1** Wait until download is finished (could take a maximum of 45 minutes), and then run the test again. **2** If the test continues to abort and there is no download in progress, escalate the problem.

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Table 126: TEST #206 playback speech memory array (PSMA) test

Error code	Test result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1 to 254	FAIL	Test failed. The error code indicates the number of byte count errors found by the Tone Detector. **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). **2** If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** Replacing the circuit pack results in loss of integrated announcements. Refer to General notes on page 316.
255	FAIL	Test failed. The Announcement Port and the Tone Detector never synchronized. Check for active GPTD-PT errors, and refer to GPTD-PT (General-Purpose Tone Detector Port) on page 1046 to diagnose them first. **1** If there are no active GPTD-PT errors, reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). **2** If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** Replacing the circuit pack results in loss of integrated announcements. Refer to General notes on page 316.
	PASS	This port can cleanly play announcements. User-reported troubles on this pack should be investigated using other port and circuit pack tests. Refer to ANN-BD (announcement circuit pack) on page 299 for a description of the circuit pack tests.

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Notes:

a The Announcement circuit pack can exhibit a condition that does not allow recording.

If the circuit pack gets locked into this state (this is an extremely rare condition), two of the Announcement Ports on the circuit pack (one of which is the record port) will be unusable by software. Also, **save/restore announcements** will not work, since the record port looks busy to the circuit pack. Note that software does not have any way of knowing this and attempts to use the ports.

If the circuit pack is locked into this state, the following symptoms are observed:

1. When attempting to record an announcement, users hear the proper record tone, but the announcement does not record (they do not know it until the announcement is played back).
2. Performing a **test board long** when the circuit pack is in this state yields the following abort codes:
   - Ports 1 and 9 abort Test #206 with code 1024
   - Ports 1 and 9 abort Test #205 with code 2000
   - Board level Tests #209 and #210 abort with code 1024
3. The **save/restore announcements** command times out with:

   Error encountered, can't complete request

The Announcement circuit pack lock-up can be cleared remotely by performing a soft reset to the circuit pack:

- **busyout board PCSS** (this command drops all calls in progress on the Announcement circuit pack)
- Reset circuit pack using the **reset board PCSS** command
- Release circuit pack using the **release board PCSS** command

140AY channel sanity inquiry test (#222)

The Angel keeps a sanity status bit for each of the 16 channels on the 140AY device. This test queries the Angel to determine the status for a particular channel. If a channel is insane, that implies that announcements cannot be played back on that channel.

Table 127: TEST #222 140AY channel sanity inquiry test

Error code	Test result	Description/ Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	Test failed. Announcements cannot be played back over this port. **1** Reset the circuit pack via the **reset board PCSS** command and then run this test again. If the test continues to fail, replace the circuit pack (see Warning). **2** If there are recurring alarms on this port caused by this test failing, replace the circuit pack even if Step 1 works (see Warning). **WARNING:** Replacing the circuit pack results in loss of integrated announcements. Refer to General notes on page 316.
	PASS	Announcements can be played back over this port. User-reported troubles on this pack should be investigated using other port and circuit pack tests. Refer to the ANN-BD (announcement circuit pack) on page 299 for a description of the circuit pack tests.

ANNOUNCE (announce)

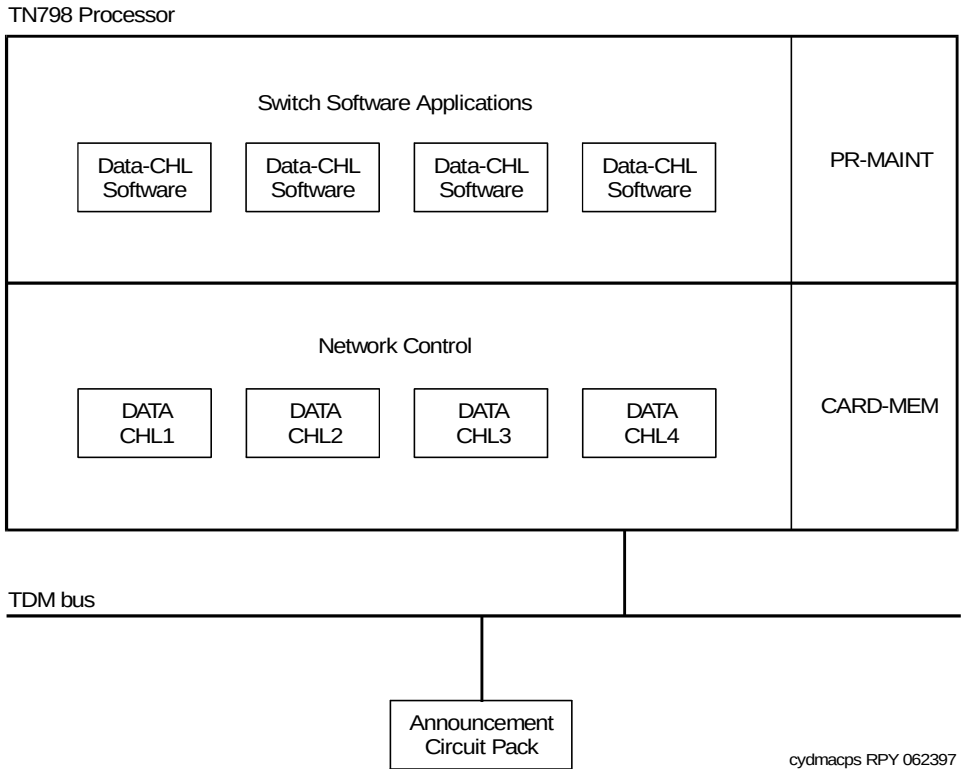
S8100 only

MO name (in alarm log)	Alarm level	Initial command to run	Full name of MO
ANNOUNCE	none	none	ANNOUNCEMENT

The ANNOUNCE MO logs an error in the hardware error log if the system fails to restore announcements from the memory card at boot time.

Figure 22, Connection of announcement circuit pack to the system, on page 326 shows the connection of the Announcement Circuit Pack to the system. To save or restore announcements, an ANNOUNCEMENT Data Extension must be administered, and at least one DATA-CHL (Network Control Data Channel) must be in the in-service/idle state.

Figure 22: Connection of announcement circuit pack to the system



Hardware error log entries

Table 128: ANNOUNCE error log entries

Error type	Aux data	Associated test	Alarm level	On/Off board	Test to clear value
1(a)(d)	any	None			
257(d)	any	None			
513(b)(d)	0	None			
769(d)	0	None			
1025(d)	any	None			

Notes:

a Error occurred while saving announcements. (See Table 129, Aux data error codes and recommended repair procedures, on page 327 in the next section for an explanation of Aux Data and for recommended repair actions.)

b User pressed cancel while announcements were being saved.

c Error occurred while restoring announcements. (See Table 129, Aux data error codes and recommended repair procedures, on page 327 in the next section for an explanation of Aux Data and for recommended repair actions.)

d The port field for this error contained the active PE complex when the error occurred.

Aux data error codes and recommended repair procedures

Table 129: Aux data error codes and recommended repair procedures

Aux data	Description/ Recommendation
9000 through 9031	CARD-MEM errors Check and resolve CARD-MEM errors and alarms.
32001	Internal system error. **1** Check other ANNOUNCE errors and take corrective action. If there are no other ANNOUNCE errors, do the following: **2** Retry the command at 2-minute intervals a maximum of 3 times. **3** If the **save/restore announcements** command fails, escalate the problem.
32002	Announcement circuit pack is in use. **1** Retry the command at 2-minute intervals a maximum of three times. **2** If the **save/restore announcements** command fails, escalate the problem.

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Table 129: Aux data error codes and recommended repair procedures

Aux data	Description/ Recommendation
32003	Announcement port is in use. **1** Wait for all Announcement ports to become available. **2** Enter the **save/restore announcements** command.
32004	There are no announcements recorded on the Announcement Circuit Pack. The **save announcements** command is not allowed to prevent the destroying of the announcement file on tape [286 systems] or on the memory card [386 systems].
32005	Integrated announcement circuit pack is not present. The Announcement Circuit Pack is not inserted, or it is defective. **1** Enter the **list config** command to check for the presence of the circuit pack in the system. **2** If the Announcement Circuit Pack is present, use the **test board PCSS** command to check the status of the Announcement Circuit Pack.
32006	Announcement Data Module not available. **1** Use the **status** command to check the status of the Announcement Data Module.
32007	Announcement Data Module out of service. **1** Use the **status** command to check the status of the Announcement Data Module.
32008	Announcement data is being saved or loaded. **1** Retry the command at 2-minute intervals a maximum of three times. **2** If the **save/restore announcements** command fails, escalate the problem.
32009	Required DATA-CHL is not administered or out of service. (A DATA-CHL is required to save or restore announcements.) **1** Add a DATA-CHL if none is administered. **2** If a DATA-CHL is administered, use the **status** command to check the status of all DATA-CHLs. At least one DATA-CHL should be in the in-service/idle state.
32010 32013	DATA-CHL is not administered, or it is unavailable. (A DATA-CHL is required to save or restore announcements.) **1** Add a DATA-CHL if none is administered. **2** If a DATA-CHL is administered, use the **status** command to check the status of all DATA-CHLs. At least one DATA-CHL should be in the in-service/idle state.
32012	Required Announcement Data Module is not administered. **1** Add an Announcement Data Module and repeat the command.

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Table 129: Aux data error codes and recommended repair procedures

Aux data	Description/ Recommendation
32015	Time of day not set. **1** Set the time of day, and reenter the **save/restore announcements** command.
32016	Internal system errors. Check for any other ANNOUNCE errors and take corrective action.If there are no other announcements errors, do the following: **1** Retry the command at 2-minute intervals a maximum of three times. **2** If the **save/restore announcements** command fails, escalate the problem.

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ASAI-ADJ (ASAI Adjunct)

S8700 / S8500 / S8100

Refer to BRI-SET, BRI-DAT, Various Adjuncts on page 520 of this chapter.

ASAI-BD (Multi-Application Platform Board)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ASAI-BD	MINOR	**test board *location***	ASAI-BD
ASAI-BD	WARNING	**test board *location***	ASAI-BD

1 For information on specifying a location, see Command Syntax on page 179.

Maintenance testing of the common circuit pack is handled by on-board firmware and server-controlled tests. Maintenance software queries the firmware for error and alarm information, status, and test results. Firmware automatically reports error conditions that result in server-controlled testing.

For MAPD board insertion, the switch makes an additional board query if any of the following circuit packs are inserted:

Circuit Pack	Vintage
TN754	49
TN556	49, 80 or greater
TN800	any

For any of the previous initial board uplinks, the switch queries the board for administration data as well as reporting the switch software release and the system type.

For the native mode, the response to the board query downlink messages consists of several CCMS uplink messages that identify the true board code, vintage, suffix, emulation type, and number of reserved slots needed.

NOTE:
Refer to LAN-BD Maintenance documentation for circuit pack level errors. See also ASAI-PT on page 341 and ASAI-EPT on page 333 for related line information. See the following exceptions listed below:

- Hyperactivity: Currently, the common circuit pack is considered "hyperactive" if the Service Dispatcher receives 200 uplink messages from the circuit pack in a 10-second period. Since MAPD has 32 ports, the hyperactivity limit increases to 500 uplink messages per 10 seconds. The switch issues an alarm when the limit reaches 400; when it reaches 500 up-link messages in 10 seconds, the board is taken out of service.
- LED use: The LED Control message 038x requests the Angel to drive the red, amber, and green LEDs on the face plate of a typical port board on or off. Only the MAPD's red LED is controlled by this message. Yellow and green change requests the MAPD receives from the switch drive LCD behavior rather than LED behavior. The system continues to send

the same LED control messages to the MAPD that the system currently sends to every other port board. The MAPD handles proper interpretation of these messages. You should note that the PC on the MAPD and the switch itself control the LEDs and the LCD on the MAPD.

- Port Administration: In Administration Without Hardware (AWOH), the switch allows administration of up to 8 ports in any of the first 12 ports. If the port type later reported by the board does not match the existing type, the switch assumes it to be a MAPD board with a different configuration and rejects the board.

ASAI-EPT

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ASAI-EPT	MAJOR[1]	**test station *extension***	ASAI-Adjunct

1 The alarm level for ASAI adjuncts is administered using the **set options** command. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI adjunct in the system.

The maintenance strategy for this endpoint MO is built on maintenance facilities offered in the Avaya ISDN-BRI protocol and in the ASAI adjuncts. Currently there are no facilities in the protocol that provide for maintenance of set data features.

The TN800 is a PC-based platform that allows interaction of multiple applications with Communication Manager at any time. Communication Manager (native mode) supports emulation of three types of port MOs on this board. The type of ports to be emulated is defined by the applications running on the TN800.

NOTE:
If the TN800 is emulating BRI, the software/firmware supports up to 12 ports, but only 8 of the 12 ports can be administered at any one time.

Error Log Entries and Test to Clear Values

Table 130: ASAI-EPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level ASAI-EPT	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test ASAI-ADJ**
2 (a)	2-102	None			
257 (b)	Any	BRI Layer 3 query	MAJOR WARNING[2]	OFF	**test station** *ext* **r 2** **test data-module** *ext* **r 2**
351 (c)	0	none	WARNING	OFF	**busyout** and **release station**
513 (d)	0	None			
769 (e)	0	None	MAJOR	OFF	
2561 (f)	0	None			
2562-2566 (g)	0	None			
2567 (h)	0	None			
2568 (i)	0	None			

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Table 130: ASAI-EPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level ASAI-EPT	On/ Off Board	Test to Clear Value
3329 (j)	Any	Signaling Link status (#626)	MAJOR WARNING†	OFF	
3584-3839 (k)	Any **S8100** : 0,1	None			
3841 (l) 4095	Any **S8100** : 0	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a Errors of this type indicate violations of the ISDN-BRI signaling protocol. Timers associated with certain layer-3 messages have expired before a required response was received. In the following table, the aux data column indicates which timer has just expired.

Aux Data	Timer Type
2	First T303 (SETUP timer)
3	Second T303 (SETUP timer)
4	T305 (DISConnect timer)
5	First T308 (RELease timer)
6	Second T308 (RELease timer)
10	T316 (RESTart timer)
12	T309 (Layer-2 Failure timer)
16	TM100 (Management Information message Timer 1)
17	TM200 (Management Information message Timer 2)
102	TASAI (ASAI Routing Timer)

The switch sent a message to an endpoint that did not respond in the allotted time. This may be due to failure of the point-to-point signaling link or because of a problem in the ASAI adjunct. To repair:

- Execute the **test station *extension*** command and perform the associated repair procedures for those tests.

b An endpoint is not responding to the service state query message sent to the adjunct or to the endpoint. This error causes an alarm to be raised. The alarm is retired when the switch receives a response to the service state query to the endpoint or to the adjunct.

When this error occurs for an ASAI adjunct, the Aux Data field indicates the state of the ASAI link and whether an invalid response or no response was received to the query from the switch, as shown in the following table:

Aux Data	ASAI Link State	Error
102	13-restarting	No response to RESTART message
104	13-restarting	Invalid response to RESTART message
152	13-restarted	No response to layer-3 query
154	13-restarted	Invalid response to layer-3 query
202	13-established	No response to layer-3 query
204	13-established	Invalid response to layer-3 query

See status bri-port in Maintenance Commands Reference (555-245-101) for an explanation of the ASAI link states.

For ASAI or Avaya adjuncts, the switch queries the adjunct every two minutes. The Layer 3 Query test is not executed for ASAI or Avaya adjuncts through a command issued from the management terminal. While alarmed for this error, the switch takes the associated port out-of-service for five seconds every 15 minutes. This action attempts to stimulate recovery actions to be taken by the adjunct.

When this error occurs for an ASAI or Avaya adjunct, the service technician should:

1. Execute the **test station *extension*** command and perform the associated repair procedures for those tests.
2. Check the health of the adjunct by following the recommended repair procedures of the manufacturer of the adjunct if the preceding step does not resolve the problem.

c This error and associated warning alarm are logged against an ASAI endpoint when the adjunct has asked the switch to suspend maintenance on the ASAI endpoint. Busying out and releasing the ASAI station clears this alarm.

d This error occurs when the endpoint sends more messages than the switch can handle. The switch suspends the reception of messages from the endpoint for a short period of time. There is no repair procedure for this error. If the condition persists, replace the endpoint.

e This error occurs when an ASAI endpoint's associated signaling link has too much traffic related to link establishment. This occurs if the signaling link is alternating between assigned and established states. If this problem persists, replace the endpoint.

f This error occurs when the ASAI-EPT message is not transmitted because the PKT-CTRL (Packet Control circuit pack) transmit buffers are exhausted. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the PKT-CTRL, the signaling link, or the ASAI adjunct. Resolve the problem by following the repair procedures for the PKT-CTRL. If these attempts fail, re-engineering the traffic on the PKT-CTRL, signaling link, or adjunct may be necessary.

g The ASAI message is not transmitted because the transmit buffer for the ASAI link is full, causing the link to be flow-controlled. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the PKT-CTRL, the signaling link, or the ASAI adjunct. Resolve the problem by following the repair procedures issued by the manufacturer of the adjunct. If these attempts fail, re-engineering of the traffic on the PKT-CTRL, signaling link, or adjunct may be necessary.

h This version of ASAI is not supported. Check the software version that is running on the ASAI adjunct.

i The adjunct identification is invalid. Check the vendor ID or software running on the ASAI adjunct.

j This occurs when the point-to-point signaling link to the endpoint goes down, except when the link goes down because either a system technician has busied out the PKT-CTRL or the PKT-BUS, or they have failed. This error raises an alarm against the endpoint or adjunct. Execute the **test station *extension* short** command and note the results of the Signaling Link Status Test (#626). If this test fails, follow the repair procedure for Test #626. The alarm is retired when the signaling link is re-established to the endpoint or adjunct.

k The switch software logs certain ASAI cause values. The cause value is determined from the following formulas:

— If the error type is greater than 3712, then the ASAI cause value is equal to the error type minus 3712. The switch sent this value to the adjunct.

— If the error type is less than 3712, then the ASAI cause value is equal to the error type minus 3584. The adjunct sent this value to the switch.

Table 131, ASAI Cause Values, on page 336 contains a description of the various ASAI cause values and recommended system technician actions associated with the cause value.

l The switch software logs certain ASAI cause values. The cause value is determined from the following formula:

— If the error type is greater than 3968, then the ASAI cause value is equal to the error type minus 3968. The switch sent this value to the endpoint.

— If the error type is less than 3968, then the ASAI cause code is equal to the error type minus 3840. The endpoint sent this value to the switch.

Table 131: ASAI Cause Values

Code	Explanation	Recommendation
0	Unrecognized ASAI Protocol Operation.	Requested ASAI protocol is not implemented by switch or adjunct. `Aux Data` field of error log entry contains protocol identifier for unrecognized operation. **1** Consult switch and adjunct documentation to determine which set of operations is supported by switch and the adjunct. Turning off adjunct operations not implemented by the switch may resolve the problem.
34	No circuit or channel available	A resource on the switch is unavailable for a call. For BRI endpoints, this cause value is not logged. For ASAI, this condition means that there are no available trunks for an outgoing call request. **1** Verify that the adjunct is administered to support the trunk capabilities of the switch. **2** Investigate trunk-group status by issuing the **status trunk** command from the SAT or by requesting trunk-group queries from the adjunct. **3** Perform trunk diagnostic procedures outlined in this manual.

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Table 131: ASAI Cause Values

Code	Explanation	Recommendation
40	Resources not available.	No available internal resources to service switch or adjunct request. Exceeds system transaction capacity for adjunct or switch. **1** May require re-engineering of adjunct services.
50	Requested facility not subscribed	Requested facility is implemented, but not administered. Potential administration problem with endpoint or adjunct. For BRI endpoints: **1** Verify the switch administration of endpoint using **display station** or **display data-module**. **2** If step 1 does not resolve the problem, refer to the endpoint's service manual and verify administration on the endpoint. For ASAI adjuncts: **1** Display the Customer Optional Features screen (administration screen) on the switch to determine which ASAI capabilities are turned on in the switch. **2** Verify that the adjunct is administered to support the identical capabilities as the switch. If there is a mismatch in the administered capabilities, then re-administer the switch and/or the adjunct to establish a consistent set of desired capabilities on both the switch and the adjunct.
58	Bearer capability not currently available	Requested bearer capability is implemented, but not administered. No B channel is administered. See code 50 above.
63	Service or option not available	Requested ASAI capability or resource is not available on the switch or adjunct. More than one adjunct may be contending for the same switch resource. Potential administration mismatch between the resource domains administered on the switch and those administered on the adjunct. **1** Verify that no overlapping administration of switch resources (for example, requesting notifications on a single domain by multiple adjuncts attempting to control a single call) exists across any adjunct connected to the switch. If an overlap exists, then re-administer the adjuncts to ensure that each adjunct is associated with a unique set of switch resources.
65	Bearer service not implemented	Requested service not implemented in switch or endpoint.
69	Requested facility not implemented	Requested service not supported in switch or endpoint. **1** Consult switch and endpoint documentation to determine service support.

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Table 131: ASAI Cause Values

Code	Explanation	Recommendation
79	Service or option not implemented	Requested service or option (or combination of selected options) is not supported (implemented) in switch or the adjunct. **1** Consult switch and adjunct documentation to determine ASAI service and options supported by both switch and adjunct. Re-administration of the switch-administered capabilities (see Customer Optional Feature screen) or those of the adjunct may be necessary to correct the problem.
81	Invalid CRV	An invalid CRV was sent by the adjunct. **1** This may indicate a CRV inconsistency between the switch and the adjunct. See the CallVisor protocol reference manual.
87	Internal switch audit	There is an inconsistency in switch data records. **1** There is no action needed, since the switch has corrected the data inconsistency.

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System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system, always investigate errors associated with the circuit pack and port first. Clearing these error codes first may also clear errors generated against the endpoint. When every circuit pack and port error has been cleared, but errors still exist against the endpoint, investigate errors in the table below. By clearing error codes associated with the Signaling Link Status test, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Status test (#626)	X	X	ND

1 D = Destructive; ND = Nondestructive

BRI Layer 3 Query Test (#629)

This test is not used by the ASAI-ADJ MO. For information about this test, see BRI-SET, BRI-DAT, Various Adjuncts on page 520.

Signaling Link Status Test (#626)

This test determines the current status of the signaling link. This test passes if the link is “bound” to an endpoint and fails if the link is “not bound.”

The definition of the term “bound” for a link depends upon the type of endpoint and may depend on the successful completion of procedures at both Layers 2 and 3 of the protocol. The definition of “bound” for ASAI type of endpoint is:

- ASAI adjuncts and BRI endpoints not administered for MIM initialization (point-to-point):

  For endpoints of this type, the signaling link is “bound” when the link is connected at Layer 2 (L2 established).

Table 132: Test #626 Signaling Link Status Test

Error Code	Test Result	Description / Recommendation
1139	ABORT	The PN’s packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute **test port *location* long** and review the results of the BRI Port Local LAN Looparound test (#618) to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Refer to PKT-CTRL maintenance documentation.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus in the PPN. **2** Execute the **test port *location* long** command and review the results of the BRI Port Local LAN Looparound Test to verify the repair.
S8700 S8500: 1187	ABORT	The circuit pack, port, or station may have been busied out. **1** Look in the Error Log for Error Type 18 (busied out) for ASAI-BD, ASAI-PT, or ASAI-EPT. **2** If this Error Type is present for ASAI-EPT only, use **release station** and run the test again. **3** If this Error Type is present for ASAI-PT and ASAI-EPT, use **release port** and run the test again. **4** If this Error Type is present for ASAI-BD, ASAI-PT, and ASAI-EPT, use **release board** and run the test again.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1113	FAIL	The signaling link is not “bound” to the adjunct. For ASAI adjuncts this error indicates that the link is disconnected at Layer 2. Since the signaling link associated with the endpoint has been identified by administration, the link is only “unbound” from the endpoint when it is disconnected. **1** Execute **status bri-port *location*** and see BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port) on page 499.
	PASS	The signaling link is connected at Layer 2 and “bound” to the ASAI adjunct.

ASAI-IP (ASAI Adjunct IP Link)

S8100 only

For information on error codes and testing, see ADJ-IP/ASAI-IP (ASAI Adjunct IP Link) on page 190.

MO name (in alarm log)	Alarm level	Initial command to run	Full name of MO
ASAI-IP	MAJOR	**test cti-link *n***	ASAI IP link

ASAI-PT

S8700 / S8500 / S8100

MO's Name (in Alarm Log	Alarm Level	Initial Command to Run[1]	Full Name of MO
ASAI-PT	MAJOR[2,3]	**test port *location* l**	ASAI ISDN BRI port
ASAI-PT	WARNING	**test port *location* l**	ASAI ISDN BRI port

1 For information on specifying a location, see Command Syntax on page 179.

2 The alarm level for ASAI adjunct ports may be administered using the **set options** command. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI adjunct port in the system.

3 All alarming for an ASAI adjunct and off-board alarming for an ASAI port is disabled if the ASAI adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm is logged against the ASAI adjunct. Check the Hardware Error and Alarm Logs to see if the adjunct has disabled alarming.

Unless otherwise stated, every maintenance action contained in this section applies to ASAI-PT and ISDN-BRI ports connected to ASAI adjuncts. This port type is administered as an ASAI-BD on the TN800 circuit pack.

The TN800 circuit pack is a PC-based platform that allows interaction of multiple applications with Avaya™ Communication Manager. Communication Manager software (native mode) supports emulation of three types of port MOs on this board. The type of ports to be emulated are defined by the applications running on the TN800. The TN800 can support up to 32 ports (time slots) at a time.

The TN800 connects to the switch through a single slot in the backplane, however its width is not limited to one slot. The number of slots occupied by the TN800 is supplied by the board during its insertion. The TN800 (Release 5 and higher) is three slots wide. The blank (reserve) slots are to the left of the functional slot.

In non-native mode the TN800 is recognized as TN556, TN2181, TN754, or TN746 based on the switch software and the application running on the TN800. In non-native mode only one type of port MO runs at any time, and the port type depends on the application running on the TN800. If the TN800 fails diagnostics in non-native mode, the system's alarm and error logs would show a failure for the board type the TN800 is emulating.

Error Log Entries and Test to Clear Values

Table 133: ASAI-PT Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level ASAI-PORT	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	(a)	Level 1 Status inquiry (#621)	MAJOR[2]	OFF	**test port** *UUCSSpp* **sh r 2**
513 (b)	0	none	(b)	ON	
1537 (c)	46210	CRC Error counter (#623)	MAJOR[2]	OFF	
3841 (d)	46208	None			
3844 (e)	46223	None			
3845 (f	46211	None			
3846 (g)	TEI	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major and Minor alarms may be downgraded to warning alarms based on the value used in the **set options** command.

Notes:

a This error occurs when the Level 1 Status inquiry fails or when the BRI circuit pack detects that Level 1 has been deactivated on the port. The `Aux Data` field contains one of the following values:

Blank	This indicates that the Level 1 Status inquiry failed.
32773	This is a message from the ASAI-Line circuit pack indicating Level 1 has been deactivated.

Refer to the repair procedures for Test #621.

b The circuit pack is having problems transmitting data to the packet bus, thus affecting the conveyance of signaling information over the D channel. This error occurs when the packet bus transmit FIFO buffer overflows. This condition probably indicates a hardware problem as well. The ASAI-PORT alarm level is MAJOR with aux data 0. Use troubleshooting procedures for both on-board hardware problems and potential off-board packet-bus problems.

c The port received an invalid frame over the D channel. When the cyclical redundancy check (CRC) errors exceed 5 within 15 minutes, the port is taken out of service for 5 seconds. If 5 more CRC errors are received within 15 minutes of the first set of 5 errors, the port is taken out of service for one minute. If 5 more CRC errors are received within 15 minutes of the last 5, the port is taken out of service for 15 minutes.

This error is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring due to a noise source, or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

- Check the wiring to the endpoints or the adjunct.
- If the problem persists, replace the endpoints or adjuncts.

d This error occurs when a Layer 1 Transmission error is detected for the port. Run the long test sequence, and note the results of the Layer 1 Transmission Error Counter test (#624).

e This error occurs when the circuit pack detects an overflow of its receive buffers. Run the long test sequence, and note the results of the Receive FIFO Overflow Counter test (#625).

f This error occurs when the BRI Port Local LAN Looparound test (#618) fails. Run the long test sequence, and note the results of Test #618.

g The TEI (Terminal Endpoint Identifier) administered for the ASAI endpoint most likely does not match the TEI administered in the ASAI adjunct. Check the switch administration of the TEI against that of the adjunct, and make sure that both are using the same TEI.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *ASAI Port Local LAN Looparound* test (#618), you may also clear errors generated from other tests in the testing sequence.

Table 134: System Technician-Demanded Tests: ASAI-PT

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
ASAI Port Local LAN Looparound test (#618)		X	D
Level 1 Status Inquiry test (#621)	X	X	ND
CRC Error Counter test (#623)		X	ND
Layer 1 Transmission Error Counter test (#624)		X	ND
Receive FIFO Overflow Error Counter test (#625)		X	ND
Clear Error Counters (#270)	X	X	ND

1 D = Destructive, ND = Nondestructive

BRI Port Local LAN Loop-Around Test (#618)

This test is **destructive**.

This test verifies the connectivity of a BRI port across the LAN Bus and executes only if the port is out-of-service. The test aborts if calls associated with the port are in-progress. Failures of this test indicate either on-board faults associated with the ASAI-PT hardware on the circuit pack or problems with the LAN Bus, which is used to form connectivity between the switch and the ASAI-PT.

The dotted lines in Figure 23, BRI Port Local LAN Loop-Around Path, on page 344 show how a loop-around test is performed across the packet bus for the D channel.

Figure 23: BRI Port Local LAN Loop-Around Path

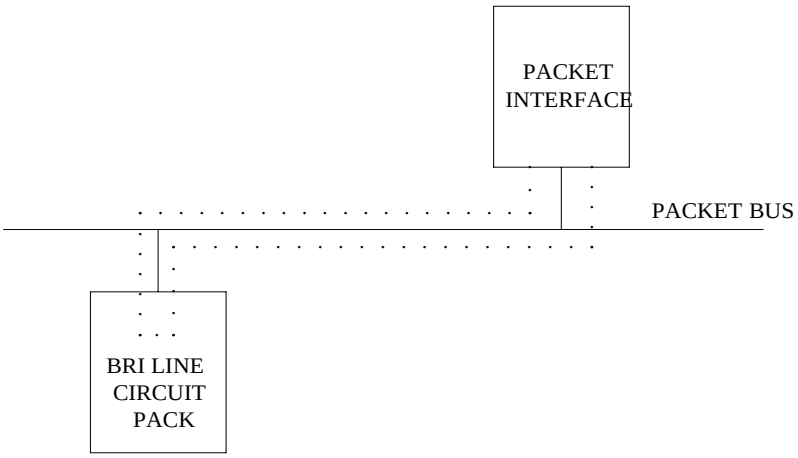

Table 135: Test #618 BRI Port Local LAN Looparound

Error Code	Test Result	Description / Recommendation
1015	ABORT	The port is not in the out-of-service state. **1** Display the Port Status screen using **status bri-port *location*** to determine which stations or adjuncts are on this port. **2** Use the extension shown on this screen in **status station** to determine whether the station or adjunct is active. **3** If the port is active, wait until it is idle, and use **busyout port *location*** to place it in the out-of-service state and repeat this test. **WARNING:** Since the "busyout" command is destructive, using this command prior to the port being idle causes every transaction associated with the ASAI on the port to be torn down. Note that 3rd-party calls established by an ASAI adjunct remain connected even though the port is taken out-of-service.
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute **test port long *location*** and review the results of the BRI Port Local LAN Looparound test to verify the repair.

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Table 135: Test #618 BRI Port Local LAN Looparound

Error Code	Test Result	Description / Recommendation
1141	ABORT	The PKT-CTRL is out-of-service. **1** Follow the repair procedures for the PKT-CTRL. **2** Issue the **test port long *location*** command and review the results of the BRI Port Local LAN Looparound test to verify the repair.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus. **2** Issue the **test port long *location*** command and review the results of the BRI Port Local LAN Looparound Test to verify the repair.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The loop-around test has failed. **1** If the test fails repeatedly, attempt to reset the circuit pack if the other ports on the board are idle. Reset the circuit pack by issuing the **busyout board *location*** and the **reset board *UUCSS*** commands. **2** If the test fails again, execute **test pkt *P*** on the management terminal. If this fails, follow the failure procedures the in PKT-BUS section. **3** If the tests executed in step 2 pass, the problem is local to the BRI board. Replace the circuit pack.
	PASS	The BRI Port Local LAN Looparound test has passed.

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Level 1 Status Inquiry Test (#621)

This test determines the state of the transmission facility of a BRI port at the Level 1 (L1) or physical layer. L1 can be in one of two possible states: Activated or Deactivated.

The Activated state is the correct state for an ISDN-BRI port. In this state the Level 1 interface can communicate with the BRI endpoint or ASAI adjunct administered on this port. This test passes if the state of L1 is activated. This test also passes if software has taken this port out of service.

The Deactivated state indicates a problem with the ASAI circuit pack. When in this state, the Level 1 interface is idle and is not trying to communicate with the BRI endpoints or adjunct. When an ASAI port is placed in the out-of-service state, Level 1 is also put into the deactivated state. This could be due either to the system detecting a fault with the port or in response to a **busyout port *location*** request.

Table 136: Test #621 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
1187	ABORT	The board, port, or station may have been busied-out by a technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port and ASAI-BD (board busied out). If this error type is present for ASAI-PT only, then release the port using **release port *location*** and run the test again. If the error is present for both ASAI-BD and ASAI-PT, then release the board with **release port *location*** and run the test again. **NOTE:** When you release a port, you release every port associated with it. If certain ports still need to be busied out, use **busyout port *location*** to busy them out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack using **busyout board *location*** and **reset board *location***. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
3	FAIL	Received a status of Level 1 Deactivated; the port is out of service. **1** Issue the **status bri-port *location*** command to verify that the service state of the port is out-of-service. If the port is not out of service, escalate the problem, or else proceed to step 2. **2** If the port has been placed out-of-service using the **busyout port *location*** command, try releasing the port by executing the **release port *location*** command. Then issue the **test port long *location*** command, and review the results of Level 1 Status Inquiry test. If this test is still failing, proceed to step 3. **3** After executing the **test port long *location*** command, review the results of every test. Follow the repair procedures for any tests that fail. Verify repair of the problem by executing the **test port *location*** command and by determining that the Level 1 Status test passes. **4** If the test continues to fail for this reason, escalate the problem.
	PASS	This test indicates that Level 1 is activated, or that software has taken the port out of service.

CRC Error Counter Test (#623)

This test reads and clears the BRI port's CRC error counter maintained on the BRI-LINE circuit pack. This counter is incremented by the circuit pack when it receives a frame from the endpoint or adjunct with a bad CRC over the D channel. The test passes if the value of the counter is 0 (the error is cleared). If the counter is not 0, the test will fail and the value of the counter is displayed in the `Error Code` field. A CRC error is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring due to a noise source (for example, electrical motors or generators), or no termination (open circuit). It usually does not indicate a problem with the BRI circuit pack. This test is used for verifying the repair of the problem.

Table 137: Test #623 CRC Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack using **busyout board *location*** and **reset board *location***. **2** If the test aborts again, replace the circuit pack. **CAUTION:** Do not leave the circuit pack busied out.
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The BRI circuit pack is still detecting CRC errors. The `Error Code` field contains the value of the counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, review the results of other tests in the long test sequence. Pay particular attention to the results of the Level 1 Status Inquiry test. Follow the repair procedures for any of the executed tests if they fail; otherwise, proceed to step 3. **3** If the tests for the endpoints or adjunct pass and the CRC error counter test continues to fail, check the wiring to the endpoints or adjunct. If the wiring appears to be OK, escalate the problem.

Layer 1 Transmission Error Counter Test (#624)

This test reads and clears the BRI port's Layer 1 Transmission error counter maintained on the ASAI circuit pack. This counter is incremented by the circuit pack when it detects a Layer 1 transmission problem. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is not zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error is most likely due to a problem with the wiring or adjunct (verify that the wiring meets the configuration rules defined in *DEFINITY® Communications System Generic 1 and Generic 3i Wiring,*

555-204-111. It does not indicate a problem with the TN800 circuit pack. This test is useful for verifying the repair of the problem.

Table 138: Test #624 Layer 1 Transmission Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack using **busyout board *location*** and **reset board *location***. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The TN800 circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, review the results of other tests in the long test sequence. Note the results of the Level 1 Status Inquiry test. Follow the repair procedures for any of the executed tests if they fail. Otherwise, go to the next step. **3** Replace the circuit pack.
	PASS	The Layer 1 Transmission error counter was read correctly and has a value of 0.

Receive FIFO Error Counter Test (#625)

This test reads and clears the BRI port's Receive FIFO error counter maintained on the TN800 circuit pack. This counter is incremented by the circuit pack when it detects an overflow of its receive buffers. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is not zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error can occur if signaling frames are being received from a packet bus at a rate sufficient to overflow the receive buffers on the circuit pack for a port or if hardware fault is causing the receive buffers not to be emptied properly. This test is useful for verifying the repair of the problem.

Table 139: Test #625 Receive FIFO Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack using **busyout board *location*** and **reset board *location***. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The TN800 circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, review the results of other tests in the long test sequence. Note the results of the Level 1 Status Inquiry test. Follow repair procedures for any of the tests that fail. Otherwise, go to the next step. **3** If the tests for the endpoints or adjunct pass and the Layer 1 Transmission Error Counter test continues to fail, check the wiring to the endpoints or adjunct.
	PASS	The Layer 1 Transmission error counter was read correctly and has a value of 0.

Clear Error Counters Test (#270)

There are various error counters associated with each ASAI-PT. This test clears those counters and triggers the auditing of layer-3 reinitialization. This test is used only to send messages to the ASAI-PT and should not abort nor fail. ASAI uses a fixed TEI value of 1.

Table 140: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The message to clear the error counters of the ASAI-PT has been sent.

ASAI-RES/E-DIG-RES (TN800 reserve slot)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ASAI-RES	NONE	NONE	TN800 ASAI reserve slot
E-DIG-RES	NONE	NONE	TN800 DIG reserve slot

There are no tests associated with these MOs. Both the **test board** and **busyout board** commands abort when either is attempted on a reserved slot. An error message indicates the slot is associated with the circuit pack that the TN800 is emulating, but the requested operation is not valid.

The TN800 MAPD (Multi-Application Platform) circuit pack connects to the switch through a single slot in the backplane. The number of slots occupied by the MAPD pack is supplied by the board when inserted. The TN800 in R5EM is three slots wide. The TN800 requires 2 reserve slots to its left. The reserve (blank) slots are to left of the functional slot and are place holders on the switch, and do not have any interaction with the switch.

Each instance of these MOs represents a reserve slot associated with respective circuit pack mode in which the MAPD is working.

ATM-BCH (ATM B-Channel Trunk)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-BCH[2]	MAJOR[3]	**test port *location* l**	ATM B-Channel Trunk
ATM-BCH	MINOR	**test port *location* l**	ATM B-Channel Trunk
ATM-BCH	WARNING	**test port *location* sh**	ATM B-Channel Trunk

1 For information on specifying a location, see Command Syntax on page 179.

2 For additional repair information, see also ATM-DCH (ATM D-Channel Port) on page 364, ATM-SGRP (ATM Signaling Group) on page 429 and PKT-BUS (Packet Bus) on page 1406.

3 A MAJOR alarm on a trunk means that alarms on these trunks are not downgraded by the **set options** command, and at least 75% of the trunks in this trunk group are alarmed.

This MO explains how you test and repair TN230x ATM Interface circuit packs (TN2305 and TN2306) that have ATM B-channel trunks administered for ATM Circuit Emulation Service (CES).

For maintenance instructions for TN230x circuit packs that are administered as Expansion Interfaces for ATM network connectivity, see ATM-INTF (TN2305/6) on page 407.

ATM Circuit Emulation Service

Under ATM Circuit Emulation Service, you simulate ISDN-PRI circuits by assigning ATM ports to *signaling groups*. Each signaling group represents a PRI circuit, and the ports in the group represent the D channel and B channels of that circuit. B channels must also be assigned to ISDN-PRI trunk groups. TN230x circuit packs support up to 248 ports per circuit pack.

Signaling Group Components

B (bearer) channels (ATM-BCH) transmit digitized voice or data, while a separate D channel (ATM-DCH) handles call-control signaling. One D channel handles signaling for a group of B channels that combine to form a signaling group (ATM-SGRP).

B-Channel Service States

The ISDN specification defines two service state categories for B channels as listed in Table 141, ATM ISDN service states, on page 352.

Table 141: ATM ISDN service states

Category	Description		
Service states			
In-Service (INS)	B channel is in normal operating state	Active	A call is connected over the B channel.
		Idle	There is no call on the B channel.
Out-of-Service/Far-End (OOS/FE)	The switch has not successfully negotiated B-channel connection as of yet. Calls cannot be placed or received. When you first administer a B channel, the switch initializes the B channel to this state while it tries to negotiate a connection to the far end. If the request times out with no response from the far end, the switch leaves the B channel in the OOS/FE state.		
Out-of-Service/Near-End (OOS/NE)	The NPE Crosstalk test has failed, or the trunk is busied out. Calls cannot be placed or received.		
Maintenance/Far-End (MTC/FE)	A request has timed out with no response from the far end after signaling is in place and B channels are in service. Calls can be received but not placed, and stable calls are unaffected.		
Maintenance/Near-End (MTC/NE)	The signaling channel (ISDN-LNK) has been busied out, possibly after a **test trunk *grp#/mbr#* long** command. Calls cannot be placed or received, but stable calls are unaffected.		
Pending states[1]			
Pending-in-Service	The near end is waiting for a response to a transition-to-service request.		
Pending-Maintenance	The near end is waiting for a transition-to-maintenance-service request (US and other country-protocol-1 systems).		

1 The switch is waiting for a reply from the far end. Pending service states remain in effect until the near end receives a response or times out.

B-Channel Alarms

The Maintenance/Far-End and Out-Of-Service/Far-End states generate warning alarms displayed with **status trunk *grp#/mbr#***.

Table 142: ATM-BCH alarms by service state

Service state	Alarm[1]	Possible cause	Possible solution
Out-of-Service/NE	Warning	Trunk busied out	Release the port (**release trunk *grp#/mbr#***).
	Minor	NPE Crosstalk test (#6) failed	Replace ATM circuit pack.
	None	ATM circuit pack lost signal or there is a circuit pack problem.	Install circuit pack or cable. Check circuit pack using procedures in ATM-BCH. Check far-end switch status.
Out-of-Service/FE	Warning	Unadministered far end	Administer the corresponding trunk on the far-end switch.
	Warning	Far-end busied out	Check the status of the far-end switch.
Pending/In-Service Pending/Maint	None	Maintenance message timed out waiting for reply	Wait 2 minutes after the pending state clears, and check the service state.
Maint/NE	None	ISDN test call in progress (**test trunk long**)	Wait for the test to finish and recheck.
	None	System link busied out	Check link status. Run **release link *link#***.
Maint/FE	Warning	Signaling channel down for over 90 sec.	See ATM-SGRP (ATM Signaling Group) on page 429 or ATM-DCH (ATM D-Channel Port) on page 364.
	Warning	Repeated lack of response to messages sent to the far end	Wait. Maintenance software resends messages periodically. Or run **test trunk *grp#/mb#*** or **test signaling-grp *grp#***.
	Warning	The far-end trunk is being tested.	Check status of the far-end switch. Wait for testing to finish.
In-Service	None	Normal operating state	

1 ATM-BCH alarms; alarms against other MOs may also be present.

Error Log Entries and Test to Clear Values

Table 143: ATM-BCH Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSppp*
1(a)	Any	None			**test port** *UUCSSppp*
18	0	**busyout trunk** ***grp/mbr***			**release trunk** *grp/mbr*
129 (b)		None	WARNING	OFF	**test port** *UUCSSppp*
130 (c)					**test port** *UUCSSppp*
257(d)	Any	Service State Audit test (#256)			**test port** *UUCSSppp*
513(e)	Any	None	WARNING	OFF	**test port** *UUCSSppp*
769(f)	Any	Service State Audit test (#256)			**test port** *UUCSSppp*
1793(g)	Any	None			**test port** *UUCSSppp*
3073(h)	Any	Service State Audit test (#256)			**test port** *UUCSSppp*
3585(i)	Any	None			none
3841(j)	Any	None	WARNING	OFF	none

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a Error Type 1: the two ends of the ATM trunk do not agree on the ISDN call state. Possible causes:

- Received a DISConnect or RELease COMplete message with cause value 52 (outgoing calls barred)
- Received a DISConnect or RELease COMplete message with cause value 54 (incoming calls barred)
- Outgoing call renegotiated by the far end to another B channel in the absence of SETUP message glare
- Near end attempted a call on a B channel that the far end has marked OOS

When running the short test sequence, pay close attention to the results of the Call State Audit test (#257).

b Error Type 129: the far-end switch changed its ISDN service state to either out-of-service or maintenance. This may be a temporary condition because the far end is testing that trunk or a hardware problem with the trunk. Outgoing calls may not be allowed over that trunk.

1 Investigate the trunk's status (**status trunk** ***grp#/mbr#***).

c Error Type 130: the circuit pack has been removed or has been insane for more than 11 minutes.

1 Reinsert or replace the circuit pack to clear the error.

d Error Type 257: SETUP received for a B channel that is in an invalid service state. Service states may be incompatible at the two ends of the trunk. A normal call was received while the B channel was MTC/FE, MTC/NE, OOS/FE, or OOS/NE or a test call was received while the B channel was OOS/FE or OOS/NE.

e Error Type 513: RELease COMplete message received with cause value 82 (nonexistent channel). The B channel may not be administered at the far end. The trunk has been placed in the OOS/FE state.

f Error Type 769: inconsistent SERVice or SERVice ACKnowledge message. Possible causes:

- SERVice or SERVice ACKnowledge message received containing a change status that is more available than the previously-transmitted SERVice message.
- Unsolicited SERVice ACKnowledge message received containing a change status that does not match the current B-channel state.

ISDN-PRI service-state negotiation rules have been violated and may indicate that a pending service-state audit is failing. The system:

- cancels the maintenance timer
- increments the Service State Audit counter
- attempts a Service State Audit

When running the short test sequence, pay close attention to the results of the Service State Audit test (#256).

g Error Type 1793: TN230x circuit pack has failed. The maintenance system

- places the trunk in the OOS/NE state
- sends a SERvice message to the far end (if possible) containing a change status of OOS for the B channel
- returns the trunk to service when the ATM trunk circuit pack reports the failure cleared

h Error Type 3073: Service State Audit attempt failed. See Service State Audit Test (#256) on page 357. Calls can be received but not placed until the test passes and the trunk state returns to In-Service.

1 Check the trunk's status (**status trunk *grp#/mbr#***).

i Error Type 3585: ISDN RESTART message received. Active calls have been dropped.

The following Aux Data values (Error Type 3585 only) below represent the trunk's ISDN call state at the time Error 3585 occurred. This information can be useful if users report dropped calls on the ISDN-PRI trunks.

Aux Data	Description
0	An idle trunk received a restart.
10	An ISDN RESTART from the far end has unexpectedly cleared a call in the ACTIVE state (call stable, parties talking).
4 7 8 260 263	An ISDN RESTART from the far end has unexpectedly cleared a RINGING call.

Aux Data	Description
1 3 6 9 265	An ISDN RESTART from the far end has unexpectedly cleared a call before the call entered the RINGING state.
11 12 19 531 267 268	An ISDN RESTART from the far end has unexpectedly cleared a call that was already in the process of clearing. If this condition occurs frequently, the far end may be trying to clear trunks that appear to be in the “hung” state.

j Error Type 3841: the far end rejected an ATM CES trunk selected by the near end 10 times. The ATM CES trunk may not be administered on the far end.

1. Get the physical name of the ATM trunk by noting the decimal number in the `Aux Data` field.
2. Check administration for the named trunk on the far end.
3. If problems persist, then busyout the ATM trunk to take it out of the hunt group.

The WARNING alarm retires automatically whenever a called endpoint answers an outgoing or incoming call that uses the alarmed trunk.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate problems in the order presented in the table below. When you clear one of the error codes associated with a given test, you clear errors generated by other tests in the testing sequence. If you clear errors out of order, you can lose important information.

Table 144: System Technician-Demanded Tests: ATM-BCH

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link State Check test (#255)	X	X	ND
Service State Audit test (#256)	X	X	ND
Call State Audit test (#257)	X	X	ND
ISDN Test Call test (#258)		X	ND

1 D = Destructive, ND = Nondestructive

Signaling Link State Audit Test (#255)

This nondestructive test checks the status of the TN230x ATM-CES Interface circuit pack and the ATM D-channel (ATM-DCH) trunk, which are both important elements to the health of the ATM-BCH trunk.

Table 145: Test #255 Signaling Link State Audit Test

Error Code	Test Result	Description / Recommendation
None	ABORT	Internal system error
0	ABORT	
1114	ABORT	Signaling link in transitional state **1** Retry the command up to 5 times at 1-minute intervals.
1018	ABORT	Maintenance disabled **1** Enable maintenance. Enter **y** in the `Maintenance Tests` field on the ***change trunk-group*** screen.
4	FAIL	Signaling channel problem **1** Look for errors or alarms against ATM-SGRP (ATM Signaling Group) on page 429 and ATM-DCH (ATM D-Channel Port) on page 364.
8	FAIL	TN230x circuit pack failed **1** See ATM-INTF (TN2305/6) on page 407.
	PASS	Signaling link OK.

Service State Audit Test (#256)

This test checks the service state of the trunk.

Country protocol 1

If the interface uses country protocol 1 (includes USA), the service-state audit executes in every trunk service state. It queries the service state on the far end and waits 2 minutes for a reply. If the first request times out, the service-state audit asks again. If the request times out again, it logs error 3073 and resends the request every 15 minutes. It places in-service trunks in the MAINTENANCE/FAR-END state (outgoing calls blocked, incoming calls accepted). Incoming calls trigger an immediate service-state audit without waiting for the end of a 15-minute cycle.

Any other country protocol

If the interface uses some other country protocol, the service-state audit executes only on trunks that are in the OUT-OF-SERVICE/FAR-END state. It asks the far-end switch to bring the trunk back into the IN-SERVICE state and waits 2 minutes for a reply. If the first request times out, the service-state audit asks again. If the request times out again, it leaves the trunk in the OUT-OF-SERVICE/FAR-END state and tries again in 1 hour.

NOTE:
PASS for this test only means that a message to the far end was successfully sent.

To check the service state of the ATM-BCH trunk, run **status trunk *grp#/mbr#***.

Table 146: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	Needed resources not available, port on a call or initializing **1** Run **status trunk *grp#/mbr#***. **1** Check the results of Test #255.
1018	ABORT	Maintenance disabled **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on the ***change trunk-group*** screen.
1113	ABORT	Signaling link failed **1** Run **status trunk *grp#/mbr#***. **2** Check the results of Test #255. **3** See ATM-SGRP (ATM Signaling Group) on page 429.
1114	ABORT	Signaling link in transitional state **1** Retry the command up to 5 times at 1-minute intervals.
1116	ABORT	Trunk not in Out-of-Service/Far-end state and country protocol other than 1
1117	ABORT	Service-state audit message outstanding **1** Wait 2 minutes, then try again.
2100	ABORT	Could not allocate needed resources **1** Retry the command up to 5 times at 1-minute intervals.
1113	FAIL	Signaling link failed **1** See ATM-SGRP (ATM Signaling Group) on page 429 and 'ISDN-PLK (ISDN-PRI Signaling Link Port) on page 1121.

1 of 2

Table 146: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
	FAIL	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
	PASS	**1** Wait 4 minutes, then check the Error Log for any new Error Type 3073. • If there are none, both sides of the ISDN connection agree on the service state. The negotiation succeeded. • If there is a new 3073 error, then the negotiation failed (the request timed out).

2 of 2

Call State Audit Test (#257)

This test audits the internal call state by asking the far-end switch for the ISDN call state. The test is particularly useful when you are trying to clear a hung call. If the internal call state on the near end differs from that on the far end, the call is torn down.

The ISDN specification allows up to 2 minutes for a reply. If a reply is not received within the 2 minute window, the test logs a protocol time-out violation against the associated signaling channel (ATM-DCH, Error Type 1).

NOTE:
PASS simply means that an appropriate message was composed and sent to the far-end switch.

Table 147: Test #257 Call State Audit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	Maintenance disabled **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on the ***change trunk-group*** screen.
1019	ABORT	Audit already in progress **1** Wait 2 minutes, and try again.
1113	ABORT	Signaling link failed **1** Check the results of Test #255 (Signaling Link State check).
1114	ABORT	Signaling link in transitional state **1** Retry the command up to 5 times at 1-minute intervals.
1116	ABORT	Trunk out-of-service **1** Check the trunk service state (**status trunk *grp#/mbr#***).

1 of 2

Table 147: Test #257 Call State Audit Test *Continued*

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate needed resources **1** Retry the command up to 5 times at 1-minute intervals.
	FAIL	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
	PASS	**1** Wait 4 minutes, then check the Error Log for call-state mismatches. If a call state mismatch is found, the call is torn down.

2 of 2

ISDN Test Call Test (#258)

This nondestructive test performs a far-end loop-around test over an ATM-BCH trunk if:

- The trunk is IN-SERVICE, MAINTENANCE/NEAR-END, or OUT-OF-SERVICE/NEAR-END.
- No calls are active on the trunk.
- The system uses country protocol 1 (including US), or the far end has loop-around capability.

The test sets up a call to a far-end switch over the ATM-BCH trunk. Then the digital port on a TN711D Maintenance/Test circuit pack sends a bit pattern to the far end and back. If the received pattern matches that sent, the test passes. If there are differences, it fails.

Synchronous Test Calls

You can initiate a synchronous outgoing test call (including a test call for ISDN-PRI trunks) with these commands:

- **test trunk *grp#/mbr#* long [*repeat#*]**
- **test board *location* long [*repeat#*]**
- **test port *location* long [*repeat#*]**

Table 148: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
4	ABORT	Signaling channel problem **1** Look for errors or alarms against ATM-SGRP (ATM Signaling Group) on page 429 and ATM-DCH (ATM D-Channel Port) on page 364.
8	ABORT	TN230x circuit-pack problem **1** See ATM-INTF (TN2305/6) on page 407.
1004	ABORT	B channel is active. **1** See if a call is active. Run **status trunk *grp#/mbr#*** command. **2** If the service state is In-Service/Idle, retry the test.

1 of 4

Table 148: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
1005	ABORT	Bad configuration (for example, no Maintenance/Test circuit pack) **1** Make sure that the Maintenance/Test circuit pack is inserted. **2** Repeat the test.
1018	ABORT	Test call disabled **1** Set the Maintenance field on the Trunk Group screen to **y**.
1020	ABORT	TN230x circuit-pack problem **1** See ATM-INTF (TN2305/6) on page 407.
1024	ABORT	Maintenance/Test digital port active **1** Wait until amber and green LEDs on the Maintenance/Test circuit pack are OFF. **2** Rerun the test. **3** If the problem persists, see M/T-DIG (Maintenance/Test Digital Port) on page 1341.
1113	ABORT	Signaling link failed **1** Check the results of Test #255 (Signaling Link State Check test).
1116	ABORT	Switch could not change the service state **1** See if calls are active. Run **status trunk *grp#/mbr#***. **2** If a call is active, proceed as for Error Code 1119. If not, check the Error and Alarm Logs and see ATM-TRK (Circuit Emulation Service Circuit Pack) on page 445.
1117	ABORT	ISDN service message outstanding **1** Wait 2 minutes. Then try again.
1118	ABORT	Far-end not administered **1** Check the administration of the far end of the ATM trunk. Run **status trunk *grp#/mbr#***. **2** Try the test again.
1119	ABORT	Test call aborted, normal call attempted **1** Wait for the call to finish normally, or drop it by running **busyout trunk *grp#/mbr#***. **2** When the trunk is idle, retry the test.
1120	ABORT	Trunk OUT-OF-SERVICE/FAR-END **1** Try to change the service state via Test #256 (Service State Audit test). **2** Try the test again.
1122	ABORT	No test-line number for the far-end switch **1** Check the Trunk Group screen.

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Table 148: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
1123	ABORT	No Feature Access Code administration for this Facility test **1** Check the Dial Plan and Feature Administration forms.
2000, 2012, None	ABORT	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
2035	ABORT	Call timed out **1** Wait 1 minute, and try again.
2036–2037	ABORT	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
2038–2039	ABORT	Problem reading test data **1** Wait 1 minute, and then try again. **2** If the test aborts again, there is a serious internal problem.
2040	ABORT	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
2041	ABORT	Call timed out **1** Wait 1 minute, and try again.
2066	ABORT	Could not establish test call **1** Retry the command up to 5 times at 1-minute intervals.
2067	ABORT	Call timed out **1** Wait 1 minute, and try again.
2074	ABORT	Bit and Block Error query failed **1** Retry the command up to 5 times at 1-minute intervals. **2** If the test continues to abort, there may be a serious internal problem in the Maintenance/Test Digital port. See M/T-DIG (Maintenance/Test Digital Port) on page 1341.
2075	ABORT	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2201–2205	ABORT	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
2206	ABORT	Could not allocate needed resources **1** Retry the command at 1-minute intervals up to 5 times.

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Table 148: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
2208	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2209–2210	ABORT	Could not allocate needed resources **1** Follow recommendations for ABORT code 2100.
2211	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2212	ABORT	Call terminated by unexpected disconnect **1** Wait 1 minute and then try again.
2213	ABORT	Call timed out **1** Wait 1 minute, and try again.
2214	ABORT	Call terminated by unexpected disconnect **1** Wait 1 minute and then try again.
2215–2219	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2220	ABORT	Call terminated prematurely **1** Wait 1 minute, and try again.
2221–2226	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2227	ABORT	Could not allocate needed resources **1** Retry the command at 1-minute intervals up to 5 times.
2042	FAIL	Test data corrupt
	PASS	Test pattern intact. If the synchronous test call was performed (long test sequence), the communications path is operating properly.

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ATM-DCH (ATM D-Channel Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-DCH[2]	MINOR	**test port *locationpp* l**	ATM D-Channel
ATM-DCH	WARNING	**test port *locationpp* sh**	ATM D-Channel

1 For information on specifying a location, see Command Syntax on page 179. In specifying a location, ***pp*** is administered as a port in the range of 9 through 32.

2 For additional related information, see ATM-TRK (Circuit Emulation Service Circuit Pack) on page 445.

NOTE:
TN230x circuit packs are not interchangeable. Always replace an ATM circuit pack with the same type.

This MO (ATM-DCH) uses the existing ISDN-PLK or D-channel maintenance strategy with modifications. The ATM circuit pack can be administered for up to 8 Circuit Emulation Service (CES) or signaling groups, each with its own D channel, as opposed to one D channel for an entire DS1 circuit pack.

NOTE:
Due to the dual personalities and the number of D channels that the ATM board can possess, the in-line errors and signaling port LAN loopback test has been moved to the MO ATM-TRK (Circuit Emulation Service Circuit Pack) on page 445. When an in-line error is sent due to packet-bus errors, the ATM circuit pack MO receives the error, not ATM-DCH.

The D-channel ISDN-PRI interface is emulated for ATM-CES and uses out-of-band signaling to transmit control messages between two endpoints. User information or bearer channels (B channels) carry digitized voice and digital data and are assigned to DS1 ISDN trunks or PRI endpoints. Call-control signaling for the B channels is combined and carried over the separate ISDN-PRI Signaling Link port D channel.

Problems with ATM-DCH affects every associated B channel, since call-control signaling cannot reach the far-end switch or terminal adapter. Stable calls can remain operational, but no new calls can be made. In turn, ATM-DCH depends on the:

- TN230X ATM Trunk circuit pack where it resides
- Packet bus that provides the link to the processor

When working ATM-DCH alarms or errors, also investigate

- ATM-TRK (Circuit Emulation Service Circuit Pack) on page 445
- PKT-BUS (Packet Bus) on page 1406

Hardware Error Log Entries and Test to Clear Values

Table 149: ATM D-channel Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp*[2]
18 (a)	0	busyout port UUCSSpp	WARNING	OFF	**release port** *UUCSSpp*
130 (b)		None	WARNING	ON	**test port** *UUCSSpp*
1793 (c)		Signaling Link Board check (#643)			**test board** *UUCSS* **l**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 pp is for ports 9–32.

Notes:

a Error Type 18: D channel busied out; no calls possible over this D channel.

b Error Type 130: circuit pack removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c Error Type 1793: ATM Trunk circuit pack failed the Signaling Link Board check (#643). Resolve any ATM-TRK errors in the Error Log.

System Technician-Demanded Tests: Descriptions and Error Codes

The command to test the ATM-DCH MO is **test port *locationpp***, where ***pp*** is for ports 9-32.

Table 150: System Technician-Demanded Tests: ATM-DCH

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Board check (#643)	X	X	ND

1 D = Destructive, ND = Nondestructive

Signaling Link Board Check (#643)

This nondestructive test checks the health of the ATM TN230X trunk circuit pack's hardware. The test runs on a periodic or scheduled basis, during initialization testing, and upon demand.

NOTE:
The board-level maintenance is handled independently of the ATM-CES signaling link maintenance, raising the possibility of inconsistent states.

Table 151: Test #643 Signaling Link Board Check

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals up to 5 times.
8	FAIL	The TN230X circuit pack is not in-service. Check the Error Log for ATM-TRK errors and resolve any using ATM-TRK (Circuit Emulation Service Circuit Pack) on page 445.
	PASS	The ATM TN230X circuit pack is in-service.

ATM-EI (Expansion Interface Circuit Pack)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-EI	MAJOR	**test board *location***	ATM Expansion Interface circuit pack
ATM-EI	MINOR	**test board *location***	ATM Expansion Interface circuit pack
ATM-EI	WARNING	**test board *location***	ATM Expansion Interface circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

This MO covers the ATM circuit pack administered as an Expansion Interface (ATM-EI) for ATM Port-Network Connectivity (ATM PNC). The ATM-EI provides PNC between a S8700 Multi-Connect server and every PN through the ATM switch.

The circuit packs listed in Table 152, ATM-EI circuit packs for S8700 Multi-Connect, on page 367 are ATM-EI boards *if they are administered to support ATM Port Network Connectivity (ATM PNC) for S8700 Multi-Connect*.

Table 152: ATM-EI circuit packs for S8700 Multi-Connect

Circuit pack	Fiber	Echo cancellation
TN2305	Multimode	Y
TN2306	Single mode	Y

NOTE:
TN230x circuit packs are not interchangeable. Always replace an ATM circuit pack with the same type.

NOTE:
ATM switch maintenance is not covered in this section. When S8700 Multi-Connect system maintenance software suspects the ATM switch connections, it raises appropriate Communication Manager alarms.
To clear any ATM switch faults, refer to the particular ATM switch's documentation.

LEDs

The ATM Interface circuit pack has three LEDs:

- Red indicates some alarm condition.
- Green indicates maintenance testing in progress.
- Amber provides useful visual information regarding the operating mode of the ATM-EI and possible error conditions.

The possible LED states are in Table 153, ATM Interface LED codes, on page 368.

Table 153: ATM Interface LED codes

LED	LED Status	Condition
Red	Steady on	Board is not healthy
	Never on	Normal conditions
Red and Green	Red LED solid on Green LED 200 msec on; 200 msec off	Board is in the processes of booting
Green	Steady on[1]	Maintenance is running tests on the board
	100 msec on - 100 msec off	No links to the board
Amber	100 msec on -100 msec off	Fiber Loss of Signal (LOS), LOF, MS_RDI, MS_AIS, LCD, HP_RDI, HP_AIS, LOP, PSC
Amber	500 msec on; 500 msec off	Signal to the ATM switch is down
Amber	2 sec on; 0.2 sec off	ATM-EI is Expansion Archangel (EAA)
Amber	Never on	ATM-EI standby

1 The green LED flashes between tests.

ATM-EI-Related Commands

The following commands can be helpful in resolving ATM-EI problems:

add atm pnc
busyout/release atm pnc
busyout/release board
change atm pnc (pnc duplication)
display atm pnc
list atm oam-statistics
list atm pnc
list measurements atm
remove atm pnc
reset board
status atm pnc
status cabinet
status port-network
test board

Replacing an ATM-EI Circuit Pack

Standard Reliability

1. Enter **busyout atm pnc #** (this is service-affecting) at the SAT.
2. Replace the ATM PNC circuit pack, and reconnect the fiber.
3. Enter **release atm pnc**.
4. Wait 2½ minutes for board insertion.
5. Enter **list sys-link** to verify that the links are up.
6. Enter **test board UUCSS,** and verify that every test passes.

Duplex or High Reliability

There is 1 ATM-EI circuit pack in each PN.

1. Enter **busyout atm pnc #** at the SAT.

   NOTE:
   If the ATM-EI is in a PN, this is service-affecting.

2. Replace the circuit pack.
3. Enter **release atm pnc**.
4. Wait 2½ minutes for board insertion.
5. Enter **list sys-link** to verify that the links are up.
6. Enter **test board *location***, and verify that every test passes.

Critical Reliability

There are 2 ATM-EI circuit packs in each PN.

1. Enter **status pnc** at the SAT. If the board is on the active side, enter **reset pnc interchange** to switch the active ATM-EI board to the standby side.
2. Enter **busyout pnc-standby.**
3. Enter **busyout atm pnc # a-pnc** or **b-pnc**.
4. Replace the circuit pack.
5. Enter **release atm pnc #.**
6. Enter **release pnc-standby.**
7. Wait 2½ minutes for board insertion.
8. Enter **test board *location***, and verify that every test passes.

Basic ATM PNC Administration

> **NOTE:**
> This section contains basic administration information only. Refer to *ATM Installation, Upgrades, and Administration using Avaya™ Communication Manager, 555-233-124,* for more detailed information.

ATM PNC connections involve administering

- 1 ATM-EI board in each PN (standard, duplex, or high reliability)
- 2 ATM-EI boards in each PN (critical reliability)

Adding ATM PNC Connections

Standard, Duplex or High Reliability

1. If the ATM-EI circuit pack is absent or if the circuit pack is present but in a PN, use the **change circuit-pack** command to add circuit pack translations.
2. Enter **add atm pnc *n*** (connection number), and administer the circuit pack's location and its ATM address.

Critical Reliability

1. Enter **change system-parameters duplication**, and change the `Enable Operation of PNC Duplication field` to **n.**
2. If the ATM-EI circuit pack is absent or is present but in a PN that does not yet have PNC connectivity to it, use the **change circuit-pack** command to add circuit pack translation for the missing circuit pack.
3. Enter **add atm pnc *n*** (connection number), and administer the circuit pack location and ATM address.
4. Enter **change system-parameters duplication**, and change the `Enable Operation of PNC Duplication` field to **y.**

Removing ATM PNC Connections

Standard, Duplex or High Reliability

> **NOTE:**
> These systems are *not* equipped with PNC duplication.

1. Enter **busyout atm pnc *n*** (connection number).
2. Enter **remove atm pnc *n*** (connection number).

Critical Reliability

1. Enter **status pnc**, and ensure that the A-PNC is active.

   If not, request a PNC interchange using the **reset pnc interchange** command.
2. Enter **busyout pnc-standby.**
3. Enter **change system-parameters duplication**, and change the `Enable Operation of PNC Duplication` field to **n.**

4 Enter **busyout atm pnc *n*** (PN's number)**.**

5 Enter **remove atm pnc *n*** (PN's number) to remove both ATM-EI boards, or enter **change atm pnc** to remove the B-side ATM-EI board.

6 Enter **change system-parameters duplication**, and change the `Enable Operation of PNC Duplication` field to **y**.

Changing Circuit Pack Location or ATM Address

Standard, Duplex or High Reliability

NOTE:
These systems are *not* equipped with PNC duplication.

1 Remove the ATM PNC connection (see Removing ATM PNC Connections above).

2 Add an ATM PNC connection (see Adding ATM PNC Connections above).

A-side ATM-EI—Critical Reliability

1 Remove the ATM PNC connection (see Removing ATM PNC Connections above).

2 Add an ATM PNC connection (see Adding ATM PNC Connections above).

B-side ATM-EI—Critical Reliability

1 Enter **status pnc**, and ensure that the A-PNC is active.

If not, request a pnc interchange using the **reset pnc interchange** command.

2 Enter **busyout pnc-standby.**

3 Enter **list config carrier**, and verify that an ATM circuit pack is assigned for the new location. If not, add the ATM circuit pack's translations.

4 Enter **busyout atm pnc *n*** (connection number) **b-pnc**.

5 Enter **change atm pnc *n*** (connection number) and change circuit pack location for the B side.

6 Enter **release pnc-standby.**

Changing ATM Address of Standby ATM PNC EI — Critical Reliability

1 Enter **busy pnc-standby.**

2 Enter **change atm pnc *n*** (connection number), and change the ATM address for the standby side.

3 Enter **release pnc-standby.**

Error Log Entries and Test to Clear Values

Table 154: ATM-EI Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS*
2 (a)		None	MIN	ON	
18 (b)	0	**busyout board** *UUCSS*	WRN	OFF	**release board** *UUCSS*
23 (c)	0	None	WRN	OFF	
125 (d)		None	MIN	ON	
131 (e)		None	MIN	ON	
257–259 (f)	Any	Expansion Interface Control Channel test (#316)	MAJ	ON	**test board** *UUCSS* **r 2**
513 (g)	Any	ATM Crosstalk test (#1298)	MIN	ON	**test board long** *UUCSS*
769 (h)	34, 35	ATM Board Error Query test (#1259)	WRN	OFF	**test board** *UUCSS*
770 (h)	31	ATM Board Error Query test (#1259)	WRN	OFF	**test board** *UUCSS*
771 (h)	26	ATM Board Error Query test (#1259)	WRN	OFF	**test board** *UUCSS*
1024–1151 (i)	Any	None	WRN/ MIN	ON	**test board** *UUCSS*
1153 (j		None	WRN	ON	**test board** *UUCSS*
1281 (k)		ATM Board Error Query test (#1259)	MAJ	OFF	**test board** *UUCSS* **r 1**
1537 (l)	12	None	MIN	ON	
1538 (m)	0	None	MIN	ON	
1793 (n)	13	None	MIN	ON	
2049 (o)	15	None	MIN	OFF	**test board** *UUCSS* **r 4**
2050 (o)		Expansion Interface Lock Query test (#304)	MIN	OFF	**test board** *UUCSS* **r 4**
2305 (p)		None	MIN	ON	
2309 (p)		Packet interface test (#598)	MIN	ON	**test board** UUCSS **r 2**
2561 (q)		Expansion Interface 2-way Transmission test (#241)	MAJ	OFF	**test board** *UUCSS* **r 3**
2817 (r)	Any	ATM Board DSP test (#1293)	MIN	ON	**test board** *UUCSS*

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Table 154: ATM-EI Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2818 (r)	Any	None	MIN	ON	**test board** *UUCSS*
3329 (s)	3	LANHO critical error	MAJ	OFF	
3585 (t)		ATM Framer Looparound test (#1260)	MAJ	ON	**test board** *UUCSS* **l**
3586 (t)		ATM Framer Looparound test (#1260)	MAJ	ON	**test board** *UUCSS* **l**
3841 (u)					
3842 (v					
3843 (w)		None			
3999 (x)	Any	None			
Any	32767[2]	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Aux Data 32767 for any error log entry indicates that an alarmed ATM-EI was busied out and then released. When this occurs, existing service-affecting alarms must be preserved. Typically, every alarm is resolved when the ATM-EI is released. Therefore, the Alarm and Error Logs must be repopulated with the alarms present at time of busyout. This Aux Data indicates that existing Error Type and Error Log time stamps are no longer valid because they were lost when the circuit pack was released.

Notes:

a **Error Type 2** — The on-board DUART chip failed. This results in communication failure between the PN's Maintenance board and the ATM-EI board. The Maintenance board should have a red LED lit, because the link to the ATM-EI is down in this PN.

1 Reset the board with the **reset board *location*** command.

2 If the board does not recover, replace the board.

b **Error Type 18** — The ATM-EI circuit pack has been busied out.

1 Release the circuit pack (**release board *location***).

c **Error Type 23** — An ATM-EI circuit pack has been administered with the **add atm pnc *n*** command, but the circuit pack has not been inserted into the system.

1 Insert an ATM-EI circuit pack at this location.

d **Error Type 125** — A wrong circuit pack is located in the slot where the ATM-EI circuit pack is logically administered.

1 Either remove the wrong circuit pack and insert the ATM-EI circuit pack or remove the ATM-EI administration (see Basic ATM PNC Administration on page 370).

2 Remove the ATM-INTF administration and re-administer the slot (**change circuit-pack**) to match the circuit-pack that is physically present in this slot.

e **Error Type 131** — An ATM-EI circuit pack has been removed from the slot for 5 minutes.

1 Insert the ATM-EI circuit pack into its administered slot.

2 Another way to resolve or prevent this alarm is to remove the ATM-EI administration (see Basic ATM PNC Administration on page 370), then remove the ATM-INTF administration (**change circuit-pack**).

It is possible that the ATM-EI could be held in reset by the PN's Maintenance board and is not inserted in the system.

1 Try issuing the **test maint *P* long** command on the maintenance board in the same PN.

f **Error Type 257** — Expansion Interface Control Channel test (#316) failed (board cannot communicate on the TDM bus control channel). Follow the suggested test procedures.

Error Type 258 — The archangel is out of sequence (Aux Data indicates angel number).

Error type 259 — The expansion archangel link (EAL) to the active ATM-EI board is down. See SYS-LINK (System Links) on page 1782.

g **Error Type 513** — The ATM Crosstalk test failed. The board is either writing to or reading from a TDM time slot that is not allocated to the board.

1 Test the board (**test board *location***), and follow the test procedures suggested for this test. In random tests of a single DSP during low or high traffic, the same DSP can be tested more than once.

h **Error Types 769 and 770** — are board-degraded alarm errors that result when the ATM switch is sending corrupted cells or excessive AAL/LAPD retransmissions (off-board ATM cell corruption errors). These errors indicate the detection of a problem in handling ATM cells that are received from the fiber interface.

Aux Data:

Error Type	Aux Data	Description
769	34	Excessive AAL-5 retransmission requests
769	35	Excessive LAPD retransmission requests
770	25	Uncorrectable ATM cell headers – threshold
771	26	VPI, VCI pair unknown

The problem is most likely *not* on the ATM-EI circuit pack reporting the errors, but it could be due to one or more of the following reasons:

- The fiber is not snugly connected to either the board or the ATM switch.
- The PN's packet bus is corrupting the cells. See PKT-BUS (Packet Bus) on page 1406 (Aux Data 35 only).
- The fiber between the ATM switch and the ATM-EI is too long (greater than 2 km for multimode fiber). Use loopback to see if the fiber is corrupting the cells.
- Some other ATM-EI board is not receiving the cells properly.
- The intervening ATM switch is dropping the ATM cells due to a shortage of bandwidth, or the S8700 Multi-Connect system is using more than the subscribed bandwidth.

Error Type 771 — The ATM switch is sending cells with unknown VPI and VCI address (wrong connection).

1 Ensure that the ATM-EI board address on the ATM switch matches the ATM-EI (ATM) address on the S8700 Multi-Connect side.

i **Error Types 1024-1151** — These errors represent problems detected by the ATM-EI board in response to SETUP and ADDPARTY requests from software.

- The Error Types and descriptions are in Table 155, ATM Error Types 1024 - 1151, on page 375.
- Aux Data values represent PN and angel numbers and are in Table 156, Error Type 1024-1151 Aux Data values (XXYYY) converted to slot number, on page 377.

Table 155: ATM Error Types 1024 - 1151

Error Type	Description	General problem
1024	Next node unreachable	ATM protocol stack on ATM-EI circuit pack
1056	DTL Transit not my node ID	

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Table 155: ATM Error Types 1024 - 1151

Error Type	Description	General problem
1088 or 1104	ATM-EI circuit pack received a request with an invalid connection identifier.	Firmware-detected problems on the ATM-EI circuit pack. Note: Error Types 1088–1103 are reported by the board that is originating the connection. Error Types 1104–1119 are reported by the board that is terminating the connection. In most cases, when the terminating board reports one of these errors, the originating board also reports an ATM-NTWK error for the same event (usually with Error Type 21).
1089 or 1105	ATM-EI circuit pack received a request with a reference to an unknown VC token.	
1090 or 1106	ATM-EI circuit pack did not have enough resources (memory) for the requested operation.	
1091 or 1107	Internal failure in the local protocol stack. This can occur when the connection to the ATM switch failed, perhaps because the: • ATM switch rebooted • fiber between the ATM switch and the ATM-EI circuit pack disconnected	
1092 or 1108	ATM-EI circuit pack received a request for which the referenced VC was in the wrong call state.	
1093 or 1109	ATM-EI circuit pack received a request for which the VPI/VCI pair was invalid or out of range.	
1094 or 1110	ATM-EI circuit pack received a request to add a party to an existing VC. The add party request failed, and a retry was not possible.	
1095 or 1111	ATM-EI circuit pack in link recovery after the lower ATM layer (Q.SAAL portion of the protocol stack) failed. This can occur when the connection to the ATM switch failed, perhaps because the: • ATM switch rebooted • fiber between the ATM switch and the ATM-EI circuit pack disconnected	
1096 or 1112	ATM-EI circuit pack received an error from the local protocol stack for which no more detailed cause was specified.	
1102	ATM-EI circuit pack asked to create more connections that it was capable of creating.	
1103	ATM-EI circuit pack detected an illegal message from software. Check the Error Log for CONN-M proc errors for more information.	
1113		Problems detected by the board terminating the connection

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1 Test the ATM-EI circuit pack (**test board *location***) and investigate further based on each test's results. If every test passes, the error was a transient problem.

Aux Data values: For Setup and Add Party connection request failure type, the port-network and the angel number of the destination ATM-EI circuit pack are logged Aux Data values in the form XXYYY, where

- port-network number = XX
- angel number = YYY

Aux Data values for WSP Setup (XX = WSP number, YYY = location code).

Since you need to know the slot number also, Table 156, Error Type 1024-1151 Aux Data values (XXYYY) converted to slot number, on page 377 converts the Aux Data to slot numbers.

Table 156: Error Type 1024-1151 Aux Data values (XXYYY) converted to slot number

Slot	Carrier														
	A			B			C			D			E		
	Failure type			Failure type			Failure type			Failure type			Failure type		
Slot #	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up
1	28	528	828	66	566	866	98	598	898	34	534	834	02	502	802
2	29	529	829	67	567	867	99	599	899	35	535	835	03	503	803
3	30	530	830	68	568	868	100	600	900	36	536	836	04	504	804
4	31	531	831	69	569	869	101	601	901	37	537	837	05	505	805
5	56	556	856	70	570	870	102	602	902	38	538	838	06	506	606
6	57	557	857	71	571	871	103	603	903	39	539	839	07	507	607
7	58	558	858	72	572	872	104	604	904	40	540	840	08	508	808
8	59	559	859	73	573	873	105	605	905	41	541	841	09	509	809
9	60	560	860	74	574	874	106	606	906	42	542	842	10	510	810
10	61	561	861	75	575	875	107	607	907	43	543	843	11	511	811
11	62	562	862	76	576	876	108	608	908	44	544	844	12	512	812
12	63	563	863	77	577	877	109	609	909	45	545	845	13	513	813
13	88	588	888	78	578	878	110	610	910	46	546	846	14	514	814
14	89	589	889	79	579	879	111	611	911	47	547	847	15	515	815
15	90	590	890	80	580	880	112	612	912	48	548	848	16	516	816
16	91	591	891	81	581	881	113	613	913	49	549	849	17	517	817
17	92	592	892	82	582	882	114	614	914	50	550	850	18	518	818
18	93	593	893	83	583	883	115	615	915	51	551	851	19	519	819
19	94	594	894	84	584	884	116	616	916	52	552	852	20	520	820

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Table 156: Error Type 1024-1151 Aux Data values (XXYYY) converted to slot number

Slot	Carrier														
	A			B			C			D			E		
	Failure type			Failure type			Failure type			Failure type			Failure type		
Slot #	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up	Set up	Add Party	WSP Set up
20	95	595	895	85	585	885	117	617	917	53	553	853	21	521	821
21	NA	NA	NA	86	586	886	118	618	918	54	554	854	22	522	822
22	NA	NA	NA	87	587	887	119	619	919	55	555	855	23	523	823

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j **Error type 1153** — The ATM connection audit found some discrepancy in the firmware's VC token numbers and live VCs. The problem is rectified in firmware and no action is needed.

k **Error Type 1281** — The loss of high-level signal indicating operational problems of equipment located outside of the circuit pack and the fiber connected to the board. Aux Data values are listed in Table 157, Error type 1281 Aux Data and repair procedures, on page 378.

Table 157: Error type 1281 Aux Data and repair procedures

Aux Data	Alarm Description	Repair procedure
15	SYSCLOCK failed	The board is not locked to the TDM backplane clock signal. This is probably due to a Tone-Clock problem. Check for TDM-BUS or TONE-BD errors in the Error Log. If no other problems are present, reset the circuit pack (**reset board *location***)
16	Loss of Signal: LOS	The fiber is not connected properly to the ATM-EI board or ATM switch (or to the multiplexer section [MUX] if present).It is possible that the board transceivers are not functioning properly. Run **test board *location*** command. If Test #1259 fails, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does the problem is off-board. If the amber LED continues to flash, replace the circuit pack.
17	Loss of Frame: LOF	The fiber signal cannot obtain or maintain STM-1/OC-3 framing. Try to move the fiber on the ATM switch side to a different port. This could require administration on the ATM switch. If the problem persists, reset the circuit pack (**reset board *location***).

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Table 157: Error type 1281 Aux Data and repair procedures

Aux Data	Alarm Description	Repair procedure
18	Multiplexer Section Alarm Indication Signal: MS_AIS	There is a major problem on the far end (between multiplexer section [MUX] and the switch) that prohibits the circuit pack from sending a valid signal. See if the ports at the MUX and/or the ATM switch are connected snugly. Run **test board *location*** command If Test #1259 fails with Error Code 18, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does, the problem is off-board. If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
19	Multiplexer Section Remote Defect Indicator: MS_RDI	The far end is detecting a major problem with the signal that this board is transmitting. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. Run **test board *location*** command. If Test #1259 fails with Error Code 19, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does the problem is off-board. If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
20	Loss of pointer: LOP	ATM framer chip is unable to access the payload part of the signal. Reset the board (**reset board *location***). If the error persists replace the board.
21	Path Signal Error (PSL) (STM1/SONET)	The incoming signal payload is not set up for transmission of ATM data. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface.

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Table 157: Error type 1281 Aux Data and repair procedures

Aux Data	Alarm Description	Repair procedure
22	High-level Path Alarm Indication Signal: HP_AIS	The payload is invalid. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. Run **test board *location***. If Test #1259 fails with Error Code 22, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does the problem is off-board. If the amber LED continues to flash, replace the circuit pack.
23	High-level path Remote defect Indicator: HP_RDI	The far end is detecting a major problem with the signal that this board is transmitting. The transmitted payload is invalid. Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-EI board) is the same as the ATM-EI circuit pack's cable interface. Run **test board *location*** command; if the Test #1259 fails with Error Code 23, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does the problem is off-board. If the amber LED continues to flash, replace the circuit pack.
24	Loss of cell delineation (LCD)	On board ATM framer chip is not able to frame cells based on the cell header. Reset the board (**reset board *location***). If the error persists, replace the board.
27	SIGCON_DOWN ATM switch high level signal.	The board cannot communicate with the ATM switch. Busyout the board (**busyout board *location***). Test the board (**test board long *location***). If Test #1260 fails, replace the board. If Test #1260 passes, make sure the ATM address on both the S8700 Multi-Connect and the ATM switch sides are the same for this board. If the address is the same, change the port on the ATM switch side. This could require administration on the ATM switch. If the error is resolved, the problem is on the ATM switch port.

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- **Error Type 1537** — LAN bus time out. The circuit pack is transmitting a packet larger than 1,024 bytes. Replace the circuit pack.

m **Error Type 1538** — A hyperactive ATM-EI circuit pack is generating an abnormal amount of control messages to the processor. When this error is generated, the system automatically resets the ATM-EI.

Duplicated PNC?	Then:
Y	service to the PN is disrupted
N	the system switches to the standby PNC

1. Enter the **reset board *location*** command for this ATM-EI circuit pack.
2. If the same error persists, replace the ATM-EI circuit pack.

n **Error Type 1793** — LANHO transmit FIFO overflow error (the transmit FIFO RAM buffers on the circuit pack overflowed). This most likely indicates a hardware problem on the circuit pack, because the speed of the LAN/packet bus is much higher than the speed of the link connected to the port.

1. Test this ATM-EI circuit pack (**test board *location***).
2. If Test #598 fails again, replace the ATM-EI circuit pack.

o **Error Types 2049 and 2050** — The ATM-EI is out of lock with the backplane system clock.

1. Test this ATM-EI circuit pack (**test board *location***).
2. If Test #304 fails, follow the repair procedures suggested for this test.

p **Error Type 2305** — Too many parity errors on data received from the LAN/packet bus (could be due to packet-bus problems).

1. Test the ATM-EI circuit pack (**test board *location***).
2. If Test #598 fails, follow the repair procedures suggested for this test.
3. If the test passes, look for and resolve any PKT-BUS (packet bus) alarms/errors.
4. If there are no PKT-BUS errors and the problem persists, escalate the problem.

Error Type 2309 — The packet-interface chip (LANHO) is malfunctioning.

1. Test the ATM-EI circuit pack (**test board *location***).
2. If Test #598 fails, follow the repair procedures suggested for this test.

q **Error Type 2561** — ATM-EI 2-way transmission failure (circuit pack is having problems creating connections to other PNs in the system).

1. Test the ATM-EI circuit pack (**test board *location***).
2. Follow the repair procedures suggested for Test #241.

r **Error Types 2817 and 2818** — A DSP test failure detected along the circuit path of the ATM-EI circuit pack.

Error Type	Description	Aux Data indicates
2817	DSP test failure	The Aux Data field contains the following information about the failed DSPs: X is the number of talker DSPs Y is the number of listener DSPs Z is the number of echo-cancelling DSPs
2818	One or more DSPs failed	DSP number that has failed

1. Test the ATM-EI circuit pack (**test board *location***).
2. Follow the repair procedures suggested for Test #1258.

s **Error Type 3329** — The on-board LANHO chip is insane, possibly due to a problem in packet-bus arbitration, the transmission line frame, or the circuit pack itself. The circuit pack cannot talk to the packet bus.

If the packet bus is alarmed:

1. Resolve any PKT-BUS errors. The probability of this error being related to a packet-bus problem increases with the number of other circuit packs using the bus that are also showing this error.

If the packet bus is *not* alarmed:

1. Reset the circuit pack (**reset board *location***).
2. If the problem persists, replace the ATM-EI circuit pack.

If the system has a duplicated PNC, and the in-line error received is from an active ATM-EI, the system switches to the standby PNC.

CAUTION:
If the system does not have duplicated PNC, services to the PN could be disrupted.

t **Error Types 3585 and 3586** — (Major board alarm) A failure of critical components involved in the operation of the circuit pack, and the switch can no longer recognize the circuit pack. If the system has a duplicated PNC and the in-line error received is from an active ATM-EI, the system switches to standby PNC.

CAUTION:
If the system does not have duplicated PNC, services to the PN could be disrupted.

Error Type 3585

Aux Data (Error Type 3585 only):

Aux Data	Description
1	ATM framer failure
2	NCE failed (only from ATM-EIs in PN)
4	TDM_PLD_FAILED
5	DSP_ALL FAILED
6	Receive Network Processor (RNP) failure
7	Transmit Network Processor (TNP) failure
8	MEMORY read/write failure

1 If the system has duplicated PNC:

a Test the ATM-EI (**test board *location* l**).

b If Error 3585 is detected again, or if the board is not recognized anymore, replace the ATM-EI circuit pack.

2 If the system does *not* have duplicated PNC and the circuit pack is in a PN:

a Replace the ATM-EI circuit pack.

Error Type 3586 — Framer Looparound test (#1260) failed.

Aux Data (Error Code 3586 only):

Aux Data	Description
2	Packet path failed
3	Circuit path failed
4	TDM loop cannot be created
5	Packet loop cannot be created

1 If Error Type 3586 is detected again, replace the circuit pack.

u **Error Type 3841** — The board received a message from the switch that it does not recognize, and the board responded with an inconsistent down link error message. This error does not affect service, and no action is required.

v **Error type 3842** — The circuit pack received data from the packet bus faster than it could distribute the data to its endpoint. This circuit pack should be able to recover by itself, and no action is necessary.

w **Error type 3843** — The firmware on the circuit pack is reporting a resource that is low. This error does not affect service and no action is required.

x **Error Type 3999** — The circuit pack sent a large number of control channel messages to the switch within a short period of time.

If	Then
Error Type 1538 is also present	Circuit pack is taken out of service
Error Type 1538 is absent	Circuit pack is *not* taken out of service, but has generated 50% of the messages necessary to be considered hyperactive. This can be normal during heavy traffic. If the error is logged during light traffic, it can indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in Table 158, System Technician-Demanded Tests: ATM-EI, on page 384 when inspecting the errors in the system. For example, by clearing error codes associated with the *Expansion Interface 2-Way Transmission* test (#241), you can also clear errors generated from other tests in the testing sequence.

Table 158: System Technician-Demanded Tests: ATM-EI

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Expansion Interface 2-Way Transmission test (#241)	X	X		ND
ATM Board Framer Looparound test (#1260)		X		D
Expansion Interface Lock Query test (#304)	X	X		ND
ATM Board Error Query test (#1259)	X	X		ND
ATM Expansion Interface Reset (#1256)			X	D
ATM board DSP test(#1293) for TN2305 and TN2306 circuit packs.	X	X		ND
ATM Cross Talk test(#1298) for TN2305 and TN2306 circuit packs		X		ND

1 D = Destructive, ND = Nondestructive

NOTE:
To get a better indication of a problem's location, test both ATM-EI circuit packs on the associated fiber link, whether the circuit packs are both ATM-EI circuit packs or not.

Expansion Interface 2-Way Transmission Test (#241)

This test is nondestructive and applies to every ATM-EI, both active and standby. It is run as part of craft short and long testing, periodic, scheduled, initialization, and error analysis testing**.** The test sets up a connection between a Tone-Clock in one cabinet and a Tone Detector in a separate cabinet and transmits a digital test count between the PNs. The ATM-EIs used to set up this connection are chosen by maintenance, not call processing. After the connection is checked for dial-tone, the connection is torn down and re-established in the opposite direction.

For this test, the second ATM-EI can reside in any PN outside the tested ATM-EI's PN. Therefore, if the test should fail in either direction, the test is repeated with a different PN, if available. This aids the fault isolation procedure.

The test results indicate if the test failed in one or both directions. The test aborts if the ATM-EIs do not exist on both ends (for example, the EIs are not administered correctly). If the test passes, the TDM and ATM framer interfaces of both ATM-EIs are functioning properly. If the test fails, a series of tests are run on the board. Figure 24, Expansion Interface 2-Way Transmit Test #241 PN X and PN Y represent any of 44 possible PNs., on page 385 shows a schematic of this test.

Figure 24: Expansion Interface 2-Way Transmit Test #241 PN X and PN Y represent any of 44 possible PNs.

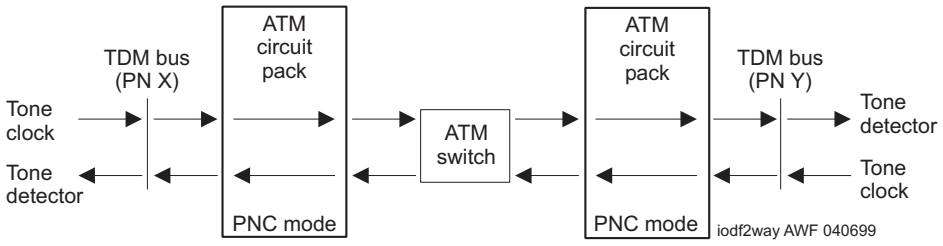

Table 159: Expansion Interface 2-Way Transmission Test (#241)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system could be under heavy traffic conditions or it can have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.

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Table 159: Expansion Interface 2-Way Transmission Test (#241)

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Verify that at least one Tone Detector resides in this PN. (Even without a TTR-LEV error, the tested circuit pack's PN could be missing a Tone Detector.) If missing, the test always aborts for this circuit pack, without harming the system. **NOTE:** A TN2182 Tone-Clock circuit pack in a PN must be of vintage B or newer. If an earlier vintage resides in a PN, this test always aborts with this abort code. **3** Resolve any TONE-PT errors. **4** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
1033	ABORT	The test cannot run because either the ATM-EI board is not administered, or there were no other PNs administered that had its ATM-EI board in-service. **1** Ensure that the board is administered as ATM PNC Expansion Interface circuit pack. **2** If the board is administered as ATM-EI circuit pack, then there has been some change in the ability of the ATM-EI circuit pack in the other PNs to communicate with the ATM-EI on the other end of its connection. **3** Using **status port *x*** (the port-network number where the board is administered), see if both ACL and EAL are up to this board. If not, see the service procedure for SYS-LINK. **4** Check the Error Log for Error Type 1281 with Aux Data 27 (board cannot talk to the ATM switch). See Figure 157, Error type 1281 Aux Data and repair procedures, on page 378 for repair procedures. **5** If present, check both the ATM switch and the Communication Manager translations for consistent ATM addresses. Reset the board, and see if the problem resolves. **6** Repeat Test #241. If it continues to abort with this abort code, replace the board.

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Table 159: Expansion Interface 2-Way Transmission Test (#241)

Error Code	Test Result	Description / Recommendation
1394	ABORT	**1** See Table 10, Error type 1281 Aux Data and repair procedures, on page 204 (Error Type 1281) with Aux Data 27 (board cannot talk to the ATM switch), and if present, check both the ATM switch and the Communication Manager translations for consistent ATM addresses. **2** Reset the board and see if the problem resolves. **3** Repeat the test.
1395	ABORT	This test cannot run on an ATM-EI circuit pack if it is part of the B-side PNC and Duplicated PNC is not enabled. **1** If this test needs to run on this ATM-EI circuit pack, enable PNC with the **change system-parameters duplication** command. **2** Prevent the system from doing a PNC interchange by executing the **set PNC lock** command. **3** Repeat this test.
1413	ABORT	This test requires the use of a Tone-Clock circuit in each of the PNs used in this test. This abort code indicates that a Tone-Clock circuit is absent from one of the PNs. **1** Verify that an IPSI or Tone-Clock circuit pack resides in the same PN as the ATM PNC Expansion Interface circuit pack under test. **2** In ATM PNC configurations, make sure that there is at least one other PN besides the PN where the ATM-EI circuit pack under test resides that contains a Tone-Clock circuit.
1414	ABORT	The active Tone-Clock circuit in one of the PNs being used for the test has a MAJOR or MINOR alarm logged against it. **1** Enter **display alarms** and resolve any TONE-BD and TONE-PT alarms.
1956	ABORT	ACL to the board is not up. See ACL status with the **list sys-link** command and follow the repair procedures for SYS-LINK.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	The test tone was not detected correctly in either direction. **1** Test the active Tone-Clocks in the PNs for which the ATM-EI circuit pack under test provides a link. This determines if the dial tone is supplied.

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Table 159: Expansion Interface 2-Way Transmission Test (#241)

Error Code	Test Result	Description / Recommendation
10MM	FAIL	The failure codes only apply to a system equipped with an ATM Switch. The letters "MM" refer to the distant or far-end PN, and "NN" to the near-end ATM-EI under test. The test tone was detected correctly in forward direction (data sent from the PN where the circuit pack under test resides and detected correctly in port network MM), but not the opposite direction. **1** Test the active Tone-Clocks on the "***MM***" PN and the PN where the ATM-EI under test resides (**test tone-clock *location***). This determines if a dial tone is supplied. **2** Ensure that the ATM address of the ATM-EI circuit pack under test matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *ATM Installation, Upgrades, and Administration using Avaya™ Communication Manager, 555-233-124,* for the procedure to check the ATM port address on the ATM switch. **3** Run Test #241 on the active ATM-EI in port network ***MM***. If this test fails with Error Code 10NN or 30NN, go back to step 2. **4** If the address was the same, replace the active ATM-EI circuit pack on port network ***MM***. **5** If this test fails with Error Code 20NN or 40NN, replace ATM-EI circuit pack that had the initial problem.
20MM	FAIL	The failure codes only apply to a system equipped with an ATM Switch. The letters "***MM***" refer to the distant or far-end PN, and "***NN***" to the near-end ATM-EI under test. **1** The test tone was detected correctly in reverse direction (data sent from port network ***MM*** was detected correctly in the PN where the circuit pack under test resides, but not the opposite direction). **2** Test the active Tone-Clock on the "***MM***" PN and the PN where the ATM-EI under test resides (**test tone-clock *location***). This determines if dial tone is supplied. **3** Ensure that the ATM address of the active ATM-EI circuit pack under test matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *ATM Installation, Upgrades, and Administration using Avaya™ Communication Manager, 555-233-124,* for the procedure to check the ATM port address on the ATM switch. **4** Run Test #241 on the active ATM-EI in port network ***MM***. If this test fails with Error Code 20NN or 40NN, go back to step 2. If the address was the same, replace the active ATM-EI circuit pack on port network ***MM***. If this test fails with Error Code 10NN or 30NN, replace ATM-EI circuit pack with the initial problem.

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Table 159: Expansion Interface 2-Way Transmission Test (#241)

Error Code	Test Result	Description / Recommendation
30MM	FAIL	The failure codes only apply to a system equipped with an ATM Switch. The letters "***MM***" refer to the distant or far-end PN, and "***NN***" to the near-end ATM-EI under test. The test failed for the first connection from the ATM-EI board under test to another PN, and the test tone was detected correctly in the forward direction (data sent from the PN where the circuit pack under test resides was detected correctly in port network MM, but not the opposite direction). **1** Test the active Tone-Clock on the "MM" PN and the PN where the ATM-EI under test resides (**test tone-clock *location***). This determines if dial tone is supplied. **2** Ensure that the ATM address of the ATM-EI circuit pack under test matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to for the procedure to check the ATM port address on the ATM switch. **3** Run Test #241 on the active ATM-EI in port network MM. If this test fails with Error Code 10NN or 30NN, go back to step 2. If the address was the same, replace the active ATM-EI circuit pack on port network MM. If this test fails with Error Code 20NN or 40NN, replace ATM-EI circuit pack with the initial problem.
40MM	FAIL	Failure code only applies to a system equipped with an ATM Switch. The letters "***MM***" refer to the distant or far-end PN, and "***NN***" to the near-end ATM-EI under test. The test failed for the first connection from the ATM-EI board under test to another PN, and the test tone was detected correctly in the reverse direction (data sent from port network ***MM*** was detected correctly in the PN where the circuit pack under test resides), but not the opposite direction. **1** Test for the Active Tone-Clocks on port network ***MM*** and the PN where the ATM-EI under test resides. This determines if dial tone is supplied. **2** Ensure that the ATM address of the active ATM-EI circuit pack in port network ***MM*** matches the ATM address on the ATM switch for the port to which this circuit pack is connected. Refer to *ATM Installation, Upgrades, and Administration using Avaya™ Communication Manager, 555-233-124,* for the procedure to check the ATM port address on the ATM switch. **3** Run Test #241 on the active ATM-EI in port network ***MM***. If this test fails with Error Code 20NN or 40NN, go back to step 2. If the address was the same, replace the active ATM-EI circuit pack on port network ***MM***. If this test fails with Error Code 10NN or 30NN, replace ATM-EI circuit pack with the initial problem.

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Table 159: Expansion Interface 2-Way Transmission Test (#241)

Error Code	Test Result	Description / Recommendation
	PASS	Tone successfully transmitted in both directions. Both ATM-EI boards and their lightwave transceivers are functioning properly.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board *location*** command. **3** Run the test again. If it fails, the ID chip on board could be bad. Replace the board and retest.

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Expansion Interface Lock Query Test (#304)

This test is nondestructive and is used to query the ATM and EI circuit packs (both active and standby) for its status concerning lock to the backplane system clock. It is run as part of periodic, scheduled, initialization, and error analysis testing. When an in-line, “out-of-lock” report comes in, this test is run to check the circuit pack’s status. The ATM-EI responds with “in lock” or “out of lock.” If the response is “in lock,” the test passes; if the response is “out of lock,” the test fails.

Table 160: Test #304 Expansion Interface Lock Query Test (#304)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

1 of 2

Table 160: Test #304 Expansion Interface Lock Query Test (#304)

Error Code	Test Result	Description / Recommendation
	FAIL	A PN's **unduplicated** ATM-EI circuit pack responded incorrectly, or a PN's **active** ATM-EI circuit pack could not communicate with the PN's circuit packs. **1** If the PN's active ATM-EI circuit pack is failing and duplicated PNC is enabled: **g** Enter **reset PNC interchange** to switch to the standby PNC. **h** Repeat the short test sequence. **i** If test continues to fail, enter **reset board *location*** to reset the ATM-EI circuit pack. **2** If the PN's unduplicated ATM-EI circuit pack is failing: **j** Enter **display errors** and **display alarms**, and follow the associated repair procedures for TDM-CLK, TONE-BD, or SYNC alarms/errors. **k** Repeat the short test sequence. **l** If test continues to fail, replace the circuit pack or transceiver.
	PASS	Communication from software to the ATM-EI circuit pack is functioning correctly.
0	NO BOARD	No board was detected by the test. **1** Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use **reset board *location***. **3** Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

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Expansion Interface Control Channel Test (#316)

This test is **non**destructive. If an ATM-EI circuit pack is an *active* ATM-EI in the PN (amber LED on long/off short), the Expansion Interface Control Channel test checks to see if the ATM-EI circuit pack can communicate with other circuit packs in the PN using the PN's TDM bus.

If the circuit pack is a *standby* ATM-EI (amber LED off), this test queries the ATM PNC Expansion Interface circuit pack for information about its type and vintage.

Table 161: Expansion Interface Control Channel Test #316

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	A PN's **unduplicated** ATM-EI circuit pack responded incorrectly, or a PN's **active** ATM-EI circuit pack could not communicate with the PN's circuit packs. **1** If the PN's active ATM-EI circuit pack is failing and duplicated PNC is enabled: **m** Enter **reset PNC interchange** to switch to the standby PNC. **n** Repeat the short test sequence. **o** If test continues to fail, enter **reset board *location*** to reset the ATM-EI circuit pack. **2** If the PN's unduplicated ATM-EI circuit pack is failing: **p** Enter **display errors** and **display alarms**, and follow the associated repair procedures for TDM-CLK, TONE-BD, or SYNC alarms/errors. **q** Repeat the short test sequence. **r** If test continues to fail, replace the circuit pack or transceiver.
	PASS	The ATM-EI circuit pack did respond correctly to test. Communication from software to the ATM-EI circuit pack is functioning. **1** Refer to other ATM-EI circuit pack tests if the link is not functioning correctly.
0	NO BOARD	No board was detected by the test. **1** Resolve any wrong board (Error 125) or no board (Error 131) issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *location***. **3** Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

Packet Interface Test (#598)

This test is nondestructive and attempts to send a data packet from the TN1655 Packet Interface circuit pack through any ATM PNC Expansion Interface circuit packs. The path the data packet takes depends on the location of the ATM PNC Expansion Interface circuit pack being tested and whether the system has duplicated port-network connectivity.

The Packet Interface Looparound test checks the packet-bus interface circuitry on this board. The on-board LANHO chip sends a data stream to the bus, retrieves it back, and checks for its consistency. If the data is consistent, the test passes; otherwise, it fails. The test aborts if the specified PN's packet bus has an active minor alarm or is out of service. This test runs as a part of initialization, periodic or scheduled error analysis, and demand-test sequences. Figure 25, Packet Interface Test (#598), on page 393 shows a schematic of the test.

Figure 25: Packet Interface Test (#598)

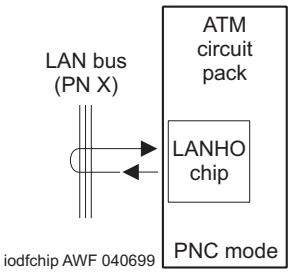

Table 162: Packet Interface Test (#598)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 retries. **2** If the test fails repeatedly, attempt to reset the circuit pack. **3** If the test continues to fail, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
ANY	FAIL	The transmitted data packet was not received correctly by the Packet Interface circuit pack. The failure can be in the ATM-EI under test, the DS1C-BD circuit packs, or the intervening Center Stage components. **1** Retry the command at 1-minute intervals up to five times. **2** If the test continues to fail, replace the circuit pack.
	PASS	The Packet Interface test passed.

ATM Board Error Query Test (#1259)

This test is nondestructive. The ATM circuit pack firmware maintains counters for some of the on- and off-board errors. The maintenance software queries the board for its health information to do error analysis. These alarms have assigned priority: if a higher priority alarm occurs, the remaining alarms are not reported to the software (through the inline errors), avoiding unnecessary up-link, in-line error message traffic. This is run as a part of a craft demand test sequence periodic testing, initialization, and error analysis.

Table 163: ATM Board Error Query Test (#1259)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
XXYY	FAIL	On-board hardware or off-board signaling errors on the board. XX indicates the on-board hardware error, and YY indicates the off-board errors on the as shown in Table 164, XXYY Error Codes for Test #1259 (ATM Board Error Query Test), on page 394. **1** Resolve any errors in error logs.
	PASS	No service effecting errors or alarms were detected on the circuit pack.
0	NO BOARD	No board was detected by the test. **1** Check the Error Log for wrong board (Error Type 125) or no board (Error Type 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error Type 1538). If hyperactive, use **reset board *location***. **3** Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

Table 164: XXYY Error Codes for Test #1259 (ATM Board Error Query Test)

XX Aux Data	Description
1	ATM framer chip failed
2	NCE chip failed
3	LANHO critical error
4	TDM Prog. logic device failed
5	Every on-board DSP failed
6	Receive network processor failed
7	Transmit network processor failed
8	Memory read failed
9	Dual UART chip failed
10	LANHO receive parity error
11	LANHO FIFO overflow error
12	LAN Bus timeout

1 of 2

Table 164: XXYY Error Codes for Test #1259 (ATM Board Error Query Test)

XX Aux Data	Description
13	LANHO Xmit FIFO overflow
14	One or more on-board DSPs failed
YY Aux Data	Description
15	Backplane clock failed
16	Loss of signal
17	Loss of frame
18	Multiplexer Section Alarm indication signal error
19	Multiplexer Section remote defect indicator error
20	Loss of pointer
21	Path signal level mismatch
22	High level path alarm indication signal
23	High level path remote defect indicator
24	Loss of cell delineation
25	Uncorrectable headers sent by the ATM switch
26	Too many cells with invalid Virtual Path Indicator (VPI)/Virtual Circuit Indicator (VCI) combination
27	The signaling link between the board and the ATM switch is down.
28	Board to the ATM switch connection is down
34	Excessive AAL-5 (ATM signaling protocol) retransmission requests
35	Excessive LAPD retransmission requests
37	ATM CLP (cell loss priority) bit – see MO ATM-NTWK (ATM Network Error) on page 410
38	ATM congestion indicator – see MO ATM-NTWK (ATM Network Error) on page 410)
39	ATM cell underrun – see MO ATM-NTWK (ATM Network Error) on page 410
40	ATM cell overrun – see MO ATM-NTWK (ATM Network Error) on page 410
41	Lost ATM cells – see MO ATM-NTWK (ATM Network Error) on page 410

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ATM Board Framer Loop-Around Test (#1260)

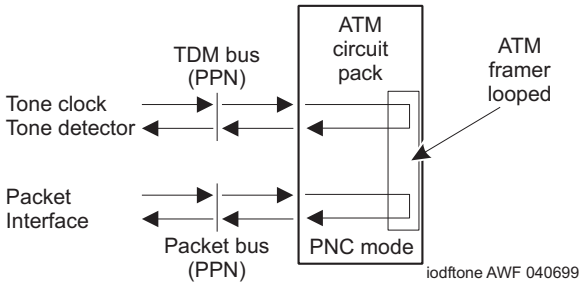
This test is **destructive**.

> **NOTE:**
> This test can be run on the standby PNC only if the board is busied out.

This test places the ATM circuit pack in ATM framer loop-around mode. Once the board receives this message, it creates a dummy virtual circuit that originates and ends on the same board, without leaving the board. This test verifies both the TDM path and the Packet Path. If the TDM test path passes, then the packet path is tested. Definitions of each test path are:

- ***The circuit (TDM) path***: one of the Tone Generators sends a bit pattern through a TDM bus time slot to the ATM framer. The pattern is converted into ATM cells and looped back to the ATM-EI board, which converts the cell back into the bit pattern and puts it on a pre-determined time slot. A Tone Detector tests for the bit pattern and reports the test result. This test verifies that a large portion of the ATM-EIs circuit paths are functioning correctly. Figure 26, ATM Board Framer Loop-Around Test (#1260), on page 396 shows a diagram of the test.

Figure 26: ATM Board Framer Loop-Around Test (#1260)



- ***Packet path***: the Packet Interface circuit pack sends packet data to the ATM framer interface, where it is mapped into ATM cells and then looped around internally. The cells are converted back to packet data after it has been looped. This portion of the test verifies correct operation of the ATM-EI's packet-bus interface and a large portion of the ATM-EI's packet paths. Figure 27, ATM Board Framer Loop-Around Test (#1260) (non-EAA, Packet Path), on page 397 shows the packet switched signal path for the ATM circuit pack.
- This test verifies the operation of a large portion of the ATM-EI circuit and packet paths, but does not verify the optical portion of the lightwave transceiver. If this test passes, the ATM-EI circuit pack is functioning correctly, but faults can exist in the lightwave transceiver. If the test fails, the fault can be on the board. After the test results are reported, the ATM framer is taken out of loopback.

> **NOTE:**
> This test can be run on active or standby ATM-EIs, but it is *not* allowed if an ATM-EI is the Expansion Archangel.

Figure 27: ATM Board Framer Loop-Around Test (#1260) (non-EAA, Packet Path)

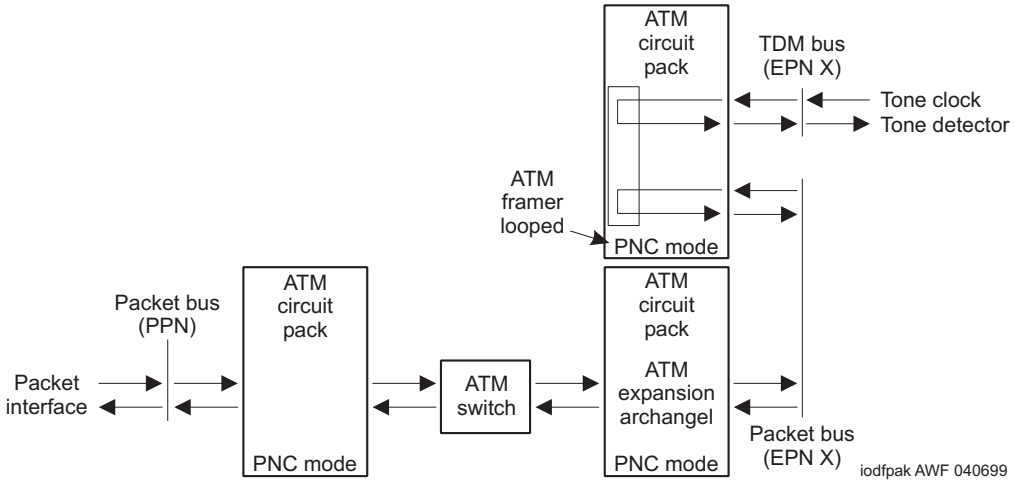


Table 165: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system could be under heavy traffic conditions or it could have timeslots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **2** Verify that at least one Tone Detector resides in this PN. (Even without a TTR-LEV error, the tested circuit pack's PN could be missing a Tone Detector.) If missing, the test always aborts for this circuit pack, without harming the system. **NOTE:** A TN2182 Tone-Clock circuit pack must be of vintage B or newer. If an earlier vintage circuit pack resides in a PN, this test always aborts with this abort code. **3** Resolve any TONE-PT errors. **4** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
1015	ABORT	The ATM-EI circuit pack has not been busied out. **1** Busyout the ATM-Expansion Interface circuit pack, then repeat **test board *location* long** .

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Table 165: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
1031	ABORT	If the ATM Expansion Interface circuit pack is in a PN and is on the active PNC, this test cannot be executed. **1** If PNC Duplication is enabled, attempt to make the standby PNC active using **reset pnc interchange**. **2** If the PNC Interchange is successful, rerun the test.
1033	ABORT	The ATM-EI circuit pack is absent. **1** Use **list atm pnc** to verify that switch recognizes the circuit pack. **2** Retry the command.
1139	ABORT	The packet bus in the PN where this ATM-EI board resides has a major alarm against it. This test needs to use the alarmed PN's packet bus. **1** Resolve any PKT-BUS problems. **2** Retry the command.
1141	ABORT	The Packet Interface circuit pack is out of service. **1** Resolve any PKT-INTF problems.
1394	ABORT	The ATM-EI board is out of service and the test cannot be run. This condition is due to a change in the ATM-EI board's ability to communicate with the ATM switch. **1** Run Test #241. If it does not pass, see repair procedures for Expansion Interface 2-Way Transmission Test (#241).
1395	ABORT	This test cannot be run on an ATM-EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. **1** If this test needs to run on this ATM-EI circuit pack, enable PNC duplication with the **change system-parameters duplication** command. **2** Prevent the system from doing a PNC interchange by executing the **set PNC lock** command. **3** Repeat this test.
1407	ABORT	This test cannot be run on an ATM-EI board that is on the active PNC because it cannot be busied out. This error code indicates that PNC duplication is enabled. **1** Attempt to perform a PNC interchange with the **reset pnc interchange** command. **2** If the PNC interchange is successful, busyout the original ATM-Expansion Interface circuit pack with the **busyout board *location*** (address of the original ATM-EI board) command. **3** Retry the command.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 165: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
2060	ABORT	The link on the packet bus being used to perform the test has failed. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort, resolve any PKT-INTF errors.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
1	FAIL	The test did not detect the test tone through the loop-around connection. **NOTE:** The packet portion of this test was not run since the circuit portion failed. **1** Test the active Tone-Clock (**test tone-clock *location***) in the PN that contains the defective ATM-EI circuit pack to verify that dial tone is being supplied. **2** If the Tone-Clock is healthy, test the ATM-EI circuit pack (**test board *location* long**). **3** If this test continues to fail, replace the ATM-EI circuit pack or transceiver. **4** Test the new ATM-EI circuit pack (**test board *location* long**).
2	FAIL	The test tone was transmitted and detected correctly, but the correct data packet was not detected by the Packet Interface circuit pack. **1** Test the Packet Interface circuit pack to verify that it is functioning properly. If any tests fail, investigate those tests and repair the Packet Interface circuit pack. **2** If the Packet Interface circuit pack is OK, resolve any DS1C-BD alarms or errors (if so equipped). **3** Test the ATM-EI circuit pack (**test board *location* long**). **4** If this test continues to fail, replace the ATM-EI board. **5** Test the new ATM-EI circuit pack (**test board *location* long**).
3	FAIL	The test tone was transmitted correctly, but the returned tone was distorted. **1** If the Tone-Clock is healthy, test the ATM-EI circuit pack (**test board *location* long**). **2** If this test continues to fail, replace the ATM-EI circuit pack. **3** Test the new ATM-EI circuit pack (**test board *location* long**).

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Table 165: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
4	FAIL	Unable to create loop for TDM path for this test. **1** Retry the command at 1-minute intervals up to 3 times. **2** If this test continues to fail, replace the ATM-EI circuit pack. **3** Test the new ATM-EI circuit pack (**test board *location* long**).
5	FAIL	Unable to create loop for packet path for this test. **1** Retry the command at 1-minute intervals up to 3 times. **2** If this test continues to fail, replace the ATM-EI circuit pack. **3** Test the new ATM-EI circuit pack (**test board *location* long**).
6	FAIL	A previously-established loop around was not released. **1** Issue the **reset board *location*** command. **2** Retry the command at 1-minute intervals up to 3 times. **3** If this test continues to fail, replace the ATM-EI circuit pack. **4** Test the new ATM-EI circuit pack (**test board *location* long*).***
	PASS	The ATM-EI board is functioning properly, however this test does not verify that the optical portion of the lightwave transceiver is functioning.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board *location*** command. **3** Run the test again. If it fails, the NCE chip on board could be bad. Replace the board and retest.

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ATM Board Time Of Day Update (#1261)

This test is **non**destructive. The ATM circuit pack requires a reference time to do SDH/SONET performance monitoring. This test updates the system time to the board and synchronizes the board with the S8700 Multi-Connect system's clock during initialization, scheduled maintenance, and craft long test.

Table 166: ATM Board Time Of Day Update (#1261)

Error Code	Test Result	Description / Recommendation
2031	FAIL	The attempt to send the message to the ATM-EI circuit pack was not successful.
2500	FAIL	Did not send the time-of-day information to the board. **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	The ATM-EI circuit pack is successfully updated with system time. **1** If **status port-network** still indicates that this link is down, it is possible that one or both of the ATM-EI circuit packs have been busied out. **2** If the link still does not come up, reset one or both ATM-EI circuit packs on the link.
0	NO BOARD	No board detected. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *location***. **3** Run the test again. If it fails, the circuit pack's NCE chip could be bad. Replace the pack and retest.

ATM Board Reset (#1256)

This test is **destructive**.

If the ATM-EI board is a standby in a PN, the reset is done through the SAKI reset interface. If the ATM-EI is an Expansion Archangel (active ATM-EI board in the PN) and if the EAL is present, a special message is sent to the board over the EAL.

Table 167: ATM Board Reset (#1256)

Error Code	Test Result	Description / Recommendation
1386	ABORT	No Active EAL to the board. This error applies only if the board under test is in a PN. Check the error logs for SYS-LINK (System Links) errors against the PN where the ATM-EI resides, and take appropriate diagnostic action for the SYS-LINK.
1015	ABORT	This test cannot be run because the ATM-EI circuit pack has not been busied out. **4** Busyout the ATM circuit pack, then repeat **test board *location* long**.
1407	ABORT	**1** Perform a PNC Interchange **2** Try to reset the board again.

1 of 2

Table 167: ATM Board Reset (#1256)

Error Code	Test Result	Description / Recommendation
None	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort escalate the problem.
2000	ABORT	Did not receive the SANITY response in the given time. **1** Wait for 5 minutes and see if board is visible to the system by using **list config all**. **2** If the board is visible, run the test again. If same abort code results, escalate the problem. **3** If the board is not visible to the system with **list configuration all**, reseat the board. **4** If the board is still not recognized by the system, replace the board.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error **1** Try to reset the board again.
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. **1** Execute command again. **2** If the problem persists, replace the circuit pack.
	PASS	The ATM-EI circuit pack is successfully reset. **1** If **status port-network** still indicates that this link is down, it is possible that one or both of the ATM-EI circuit packs are busied out. **2** If the links do not come up after reset, review the error logs and take appropriate diagnostic action.

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ATM Cross Talk Test (#1298)

This test is nondestructive. The ATM board Cross Talk test verifies that the selected TDM bus time slot never crosses over to time slots reserved for other connections. The test also checks for cross connections, where the board talks to time slots other than those specified. Since this test uses many system resources (TDM time slots, Tone Generator, Tone Detector, and others), it runs as a part of demand test only.

This test fails if either the TDM programmable logic and/or the interface to the DSP is not operating properly. Failure of these components can result in 1-way or noisy connections. Refer to Figure 28, ATM Cross Talk Test #1298 schematic, on page 403 for a schematic of this test.

NOTE:
Note: This test takes approximately 12 minutes and applies only to TN2305 and TN2306 circuit packs.

Figure 28: ATM Cross Talk Test #1298 schematic

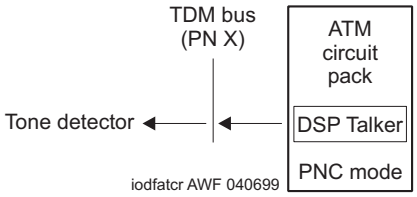

Table 168: ATM Crosstalk Test (#1298)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system could be under heavy traffic conditions or it could have time slots out-of-service due to TDM-Bus errors. Refer to TDM-BUS to diagnose these errors. **1** If the system has no TDM-Bus errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors in the Error Log. **2** Resolve any TONE-PT errors in the Error Log. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1962	ABORT	Every TALKER DSP is busy (an unlikely event). **1** Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Inconsistent uplink message from the ATM-EI board. This is a very unlikely event. **1** Retry the command at 1-minute intervals up to 3 times.
2752	ABORT	The circuit pack in this location is not a TN230X.

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Table 168: ATM Crosstalk Test (#1298)

Error Code	Test Result	Description / Recommendation
1–8, None	FAIL	The board is writing to unauthorized TDM time slots. The error code indicates the number of faulted TALKER DSPs. **1** Retry the command up to 3 times. **2** If the failure persists, replace the circuit pack.
1–8	PASS	The board is not talking to unauthorized time slots on the TDM Bus. The error code indicates the number of TALKER DSPs that were tested.

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ATM Board DSP Test (#1293)

This test is **non**destructive and is designed to test the board's interface to the TDM bus and the functions of all 24 on-board DSPs (Digital Signal Processors). There are three functional types of DSPs:

- talkers – put data on the TDM bus
- listeners – take data off the TDM bus
- echo cancelers – as implied

Listener and echo cancelers are tightly coupled because firmware allocates *sets* of DSPs. Since there are a total of 24 DSPs on the board, there can be up to 8 triplets allocated.

If the test fails for every DSP, a MAJOR alarm is raised against the board. If the test fails for one or more DSPs, a MINOR alarm is raised. If a DSP is busy, the test for that particular DSP is considered passed. The test aborts if the system resources (for example, the TDM time slots, Tone Generator, and others) are not available.

This test applies to TN2305 and TN2306 ATM-EIs, both active and standby, and is run as part of craft short and long testing, periodic, scheduled, initialization, and error analysis testing. Refer to Figure 29, ATM Board DSP Test (#1293), on page 404 for a diagram of this loop-around test.

Figure 29: ATM Board DSP Test (#1293)

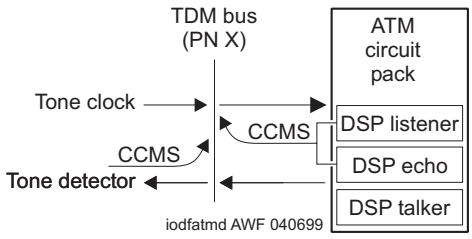

Table 169: ATM Board DSP Test (#1293)

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system could be under heavy traffic conditions or it could have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Verify that at least one Tone Detector resides in this PN. (Even without a TTR-LEV error, the tested circuit pack's PN could be missing a Tone Detector.) If missing, the test always aborts for this circuit pack, without harming the system. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
1962	ABORT	Every DSPs is busy (an unlikely event). **1** Retry the command at 1-minute intervals up to 3 times.
2000	ABORT	Response to the test was not received within the allowable time period for some of the DSPs. **1** If the board is in standby, reset the board and run the test again. **2** Look into the Error Log for Error Type 1218 (bad DSP). If Error Type 1218 is not logged against this board, run the DSP test again and see if the error persists.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2302	ABORT	Inconsistent uplink message from the ATM-EI board (an unlikely event). **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error
2752	ABORT	The circuit pack in this location is not a TN230X.

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Table 169: ATM Board DSP Test (#1293)

Error Code	Test Result	Description / Recommendation
XYZ	FAIL	A device on the circuit pack is failing. There is at least one bad DSP on the board. Values are as follows: • The X value indicates the number of talker DSPs • Y indicates the number of listener DSPs • Z indicates the number of Echo Canceler DSPs that have failed the test. **1** Run the tests for the active Tone-Clock in the PN that contains the indicted ATM-EI circuit pack to verify that dial-tone is supplied. **2** If the Tone-Clock is healthy, repeat the short test on the ATM-EI board. **3** If this test continues to fail, replace the ATM-EI circuit pack.
XYZ	PASS	The test passed for some or all DSPs depending on XYZ values. XYZ indicates the number of talker, listener and echo-canceler DSPs for which the test passed, respectively. In the DSPs that passed the test, the test tone was correctly detected by the DSP Listener and by tone-detector for the DSP Talkers on both buses, and the Echo Canceler DSPs are working properly.
0	NO BOARD	No board was detected by the test. **1** Check the Error Log for wrong board (Error Type 125) or no board (Error Type 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error Type 1538). If hyperactive, use the **reset board *UUCSS*** command. **3** Run the test again. If it fails, the circuit pack could be bad. Replace the circuit pack and retest.

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ATM-INTF (TN2305/6)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ATM-INTF	WARNING	**test board *location***[1]	ATM interface board

1 For information on specifying a ***location***, see Command Syntax on page 179

The system recognizes a TN2305/6 as an ATM interface board (ATM-INTF) unless it has an assigned personality (**add atm pnc** or **add atm trunk**). ATM-INTF does not have an associated maintenance strategy, although the:

- list config and change circuit-pack commands reveal the board
- **test board** command runs an on-demand Control Channel test
- **reset board** command resets the board

The following circuit packs are ATM-EI boards if they are administered to provide ATM port-network connectivity (ATM PNC).

Table 170: ATM-EI circuit packs for ATM PNC

Circuit Pack	Fiber	Echo Cancellation	Release
TN2305	Multimode	Yes	7.1
TN2306	Single-mode	Yes	7.1

NOTE:
Always replace an ATM-EI circuit pack with the same type.

Error Log Entries and Test-to-Clear Values

Table 171: ATM-INTF Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test-to-Clear Value
23 (a)	0	None	Warning	Off	
125 (b)		None	Minor	On	
217 (c)	0	None	Warning	Off	

Error Log Entry Notes:

a Error Type 23: The ATM expansion interface circuit pack is administered through a **change circuit-pack** command, but has not been inserted into the system. Insert the circuit pack.

b Error Type 125: A wrong circuit pack is located in the slot where this circuit pack is logically administered. To resolve this problem either remove the wrong circuit pack or insert the logically-administered circuit pack.

c Error Type 217: The ATM circuit pack is physically present but has not been given a personality. Remove the circuit pack or administer it using the **add atm pnc** command or the **add atm trunk** command.

System Technical Demanded Tests: Descriptions and Error Codes

Test failure is not logged in the error log.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop Around test (#52)	X	X	ND

1 D = Destructive, ND = Nondestructive

Control Channel Loop-Around Test

This test queries the circuit pack for its circuit-pack code and vintage, and verifies its records.

Table 172: Test #52: Control Channel Loop-Around

Error Code	Test Result	Description / Recommendation
2000	ABORT	The response to the test request was not received within the allowable time period.
2100	ABORT	The system resources required to this test are not available.
2500	ABORT	Internal system error — Retry the command at 1-minute intervals up to 5 times.

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Table 172: Test #52: Control Channel Loop-Around

Error Code	Test Result	Description / Recommendation
	FAIL	The circuit pack failed to return the circuit pack code or vintage. **1** Retry the command up to 5 times. **2** If the problem continues, reset the circuit pack. **3** Retry the command up to 5 times.
	PASS	Communication with this circuit pack is successful.
Any	NO BOARD	This is normal if the test is being executed when: **1** The board is not physically in the system. **2** The system is booting. Otherwise, there is some inconsistency in the date stored in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in the process of booting. **3** Retry the command at 1-minute intervals up to 5 times.

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ATM-NTWK (ATM Network Error)

S8700 MC only

MO's Name (in Alarm Log)	Physical Name (in Error Logs)[1]	Alarm Level	Full Name of MO
ATM-NTWK	ATUUP	WARNING	ATM Network Error
ATM-NTWK	UUCSS	WARNING	ATM Network Error

1 *AT* indicates it is an ATM switch-related address, *UU* is the connection number. The connection number can be converted into a board location by the command **display atm pnc *UU***, which shows the translations for the board that reported the ATM network error. *P* indicates if the ATM-EI board (reporting the ATM network error) is on the PNC's A side or the B side. If the system is simplex, only A is valid.

In an ATM PNC configuration, a proprietary Center Stage Switch (CSS) is replaced by an ATM network. Since CSS nodes are replaced by the ATM network in the ATM PNC configuration, SNI boards are no longer needed. In place of the SNI boards, ATM Expansion Interface (EI) or ATM Circuit Emulation Service (CES) boards are connected to an ATM switch port over a fiber-optic cable. The ports on the ATM switch are under control of its maintenance software. Refer to *ATM Installation, Upgrades, and Administration using Avaya™ Communication Manager, 555-233-124,* for more information.

An error against this MO indicates a problem in the ATM network (including the ATM switch) that is affecting service quality. These error events are either:

- Reported by the ATM network to an ATM EI or ATM CES board
- Detected by either the ATM EI or ATM CES board itself

Since these errors are ***not*** related to the ATM EI or ATM CES board, they are not reported against the ATM-EI or ATM-TRK MO. However, some of these errors invoke alarms that require action by the system's maintenance software, while other log-only errors require no action.

Error Codes and Aux Data values

The Cause Code/Error Type information is shown in Table 173, Error codes and Aux data values ATM-NTWK, on page 410. These are the possible errors that can be logged against the ATM-NTWK MO.

If the ATM-NTWK MO receives more than 6 errors, the most recent are discarded.

Table 173: Error codes and Aux data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
NORMAL EVENTS		
0	(a)	Network unreachable
1	(a)	Unallocated (unassigned) number. This cause indicates that the called party cannot be reached because, although the number is in a valid format, it is not currently assigned (allocated).

Table 173: Error codes and Aux data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
2	(a)	No route to specified transit network. This cause indicates that the equipment sending this cause has received a request to route the call through a particular network that it does not recognize, either because the transit network does not exist or because that particular transit network does not serve the equipment that is sending this cause. This cause is supported on a network-dependent basis.
3	(a)	No route to destination. This cause indicates that the called party cannot be reached because the network through which the call has been routed does not serve the destination desired. This cause is supported on a network-dependent basis.
10	(a)	VPCI/VCI unacceptable. This cause indicates that the virtual channel most recently identified is not acceptable to the sending entity for use in this call.
16	(a)	Normal call clearing. This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared. Under normal situations, the source of this cause is not the network.
17	(a)	User busy. This cause indicates that the called party is unable to accept another call because the user busy condition has been encountered. This cause value can be generated by the called user or by the network.
18	(a)	No user responding. This cause is used when a called party does not respond to a call establishment message with a connect indication within the prescribed period of time allocated.
21	(a)	Call rejected. This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible. **NOTE:** If the call was rejected by the far-end ATM-EI or ATM-CES board, there could also be additional information about this rejection in an ATM-EI error log entry. Look for an ATM-EI or error with an Error Type between 1104 and 1119 inclusive, with approximately the same time stamp as this error.
22	(a)	Number changed. This cause is returned to a calling party when the called party's number indicated by the calling user is no longer assigned. The new called party's number can optionally be included in the diagnostic field. If a network does not support this capability, cause number 1 "*unassigned (unallocated) number*" is used.
23	(a)	User rejects every call with CLIR (calling line identification restriction). This cause is returned by the called party when the call is offered without calling party's number information and the called party requires this information.

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Table 173: Error codes and Aux data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
27	(a)	Destination out of order. This cause indicates that a user-indicated destination cannot be reached because a signaling message could not be delivered to the remote user over the destination's interface (for example, a physical-layer or SAAL failure at the remote user, or remote user's equipment is off line).
28	(a)	Invalid number format (address incomplete). This cause indicates that the called user cannot be reached because the called party's number is not in a valid format or has insufficient digits.
30	(a)	Response to STATUS ENQUIRY. This cause is included in the STATUS message when the reason for generating the STATUS message was the prior receipt of a STATUS ENQUIRY message.
31	(a)	Normal, unspecified. When no more specific cause values apply, this cause reports a normal event.
32	(a)	DTL transit not-my-node ID
RESOURCE UNAVAILABLE		
35	(a)	Requested VPCI/VCI not available. This cause indicates that the requested VPCI/VCI is not available. This can be caused by mismatched VCI ranges on different ATM switches.
36	(a)	VPCI/VCI assignment failure
37	(a)	User Cell Rate not available
38	(a)	Network out of order. This cause indicates that the network is not functioning correctly and that the condition is likely to last a relatively long time. (Immediately retrying the call is unlikely to succeed.)
41	(a)	Temporary failure. This cause indicates that the network is not functioning correctly, but the condition is unlikely to last long. (Immediately retrying the call is likely to succeed.)
43	(a)	Access information discarded. This cause indicates that the network could not deliver access information to the remote user as requested (that is, ATM adaptation-layer parameters, Broadband low-layer information, Broadband high-layer information, or sub-address as indicated in the diagnostic).
45	(a)	No VPCI/VCI available. This cause indicates that no appropriate VPCI/VCI is currently available to handle the call.
47	(a)	Resource unavailable, unspecified. When no more specific cause values apply, this cause reports a resource-unavailable event.
SERVICE OR OPTION UNAVAILABLE		
49	(a)	Quality of Service unavailable. This cause reports that the requested Quality of Service cannot be provided.
51	(a)	User cell rate not available. This cause reports that the requested ATM Traffic Descriptor is unobtainable.

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Table 173: Error codes and Aux data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
57	(a)	Bearer capability not authorized. This cause indicates that a user-requested bearer capability is implemented by the cause-sending equipment, but the user is not authorized to use the capability.
58	(a)	Bearer capability not currently available. This cause indicates that the user-requested bearer capability is implemented by the cause-sending equipment, but the capability is currently unavailable.
63	(a)	Service or option not available, unspecified. When no more specific cause values apply, this cause reports an unavailable service or option event.
65	(a)	Bearer capability not implemented. This cause indicates that its sending equipment does not support the bearer capability requested.
73	(a)	Unsupported combination of traffic parameters. This cause indicates that the combination of traffic parameters contained in the ATM traffic descriptor information element (IE) is not supported.
78	(a)	AAL parameters cannot be supported.
INVALID MESSAGES		
81	(a)	Invalid call reference value. This cause indicates that its sending equipment received a message with a call reference that is currently inactive on the user-network interface.
82	(a)	Identified channel does not exist. This cause indicates that its sending equipment received a request to use a channel not activated for the call's interface.
88	(a)	Incompatible destination. This cause indicates that its sending equipment received a request to establish a call with either Broadband low-layer information, Broadband high-layer information, or other compatibility attributes that cannot be accommodated.
89	(a)	Invalid endpoint reference value. This cause indicates that its sending equipment has received a message with an endpoint reference that is currently idle on the user-network interface.
91	(a)	Invalid transit network selection. This cause indicates that a transit network identification was received in an incorrect format.
92	(a)	Too many pending add-party requests. This cause indicates a temporary condition when the calling party sends an add-party message, but the network rejects the message due to full queues.
93	(a)	AAL parameters cannot be supported. This cause indicates that its sending equipment received a request to establish a call with ATM adaptation-layer parameters that cannot be accommodated.
PROTOCOL ERROR		
96	(a)	Mandatory information element (IE) is missing. This cause indicates its sending equipment has received a message with a missing IE.

Table 173: Error codes and Aux data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
97	(a)	Message type either non-existent or not implemented. This cause indicates that its sending equipment received a message with an unrecognized type — either because the type is undefined, or defined but not implemented by the cause-sending equipment.
99	(a)	Information element (IE) either non-existent or not implemented. This cause indicates that its sending equipment received a message with an unrecognized IE — either because the IE's identifier(s) are undefined, or defined but not implemented by the cause-sending equipment. This cause indicates that its sending equipment discarded the IE. However, the equipment could still process the message since this IE was not required.
100	(a)	Invalid contents in information element (IE). This cause indicates that its sending equipment received and implemented an IE. However, one or more of the IE's fields are coded in a way that the cause-sending equipment has not implemented.
101	(a)	Message not compatible with call state. This cause indicates receipt of a message that is incompatible with the call state.
102	(a)	Recovery on timer expiration. This cause indicates that a timer's expiration initiated an error-handling procedure.
104	(a)	Incorrect message length
111	(a)	Protocol error, unspecified. When no more specific cause values apply, this cause reports a protocol-error event.
257 to 300 (b)	(b)	ATM Impaired Paths **1** Examine the error log (**display errors**), atm setup-events log (**list measurements atm svc-setup**), and atm pnc-latency (**list measurements atm latency**) screens to help diagnose the problem — although the switch could be operating normally. In this case, you should consider raising the Activation threshold and/or increasing the Timeout value on the ATM-RELATED System Parameters screen. (**change system atm**). You can use the **list measurements atm svc-setup** command to provide information about errors associated with connection numbers. **2** After entering the above command, note the time stamps shown in the ***list measurements atm setup-events*** screen. Execute the above command periodically and note the time stamps. If the time stamps have changed for a particular From Conn-To Conn pair, this indicates there are still setup failures/delays for that connection. **3** After verifying that every associated ATM endpoint is operating correctly, and if errors are still occurring, contact your local service provider.
301 (c)	ANY	System wide ATM Impaired Paths. See the suggestions listed above to trouble shoot these errors.

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Table 173: Error codes and Aux data values ATM-NTWK

Cause Code/ Error Type	Aux Data	Cause Codes Description
769 (d)		ATM CLP (Cell Loss Priority) Bit Errors
1025 (e)		ATM Congestion Bit Errors
1281 (f)		ATM Cell Underrun Errors
1537 (g)		ATM Cell Overrun Errors
1793 (h)		ATM Lost Cells

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Notes:

a Aux Data values for Setup and Add Party (XX = port network, YYY = location code).

Aux Data values for WSP Setup (XX = WSP number, YYY = location code).

Table 174, Location codes from Aux Data values, on page 415 is a list of UNI 3.1 location codes:

Table 174: Location codes from Aux Data values

Setup (Location Code)	Add Party (Location Code)	WSP Setup (location Code)	Location Code Meaning
0	500	800	User
1	501	801	Private network serving the local user
2	502	802	Public network serving the local user
3	503	803	Transit network
4	504	804	Public network serving the remote user
5	505	805	Private network serving the remote user
7	507	807	International network
10	510	810	Network beyond interworking point

b **Error Types 257 to 300** — These error type numbers are used to determine the destination PNC connection number of an ATM Network connection that is experiencing an impaired path. The connection number is obtained by subtracting 256 from the number that is shown in the Error Type field. See the following example:

ERROR TYPE field = 263
Subtract = 256
PNC destination connection # = 7

The AUX DATA field contains the originating and destination PN number (XXYY). Where XX = the originating PN #, and YY = the destination PN # for example:

1 AUX DATA = 302
3 = orig
2 = dest

2 Example AUX DATA = 1510
15 = orig
10 = dest

c **Error Type 301** — indicates that there is a system wide impaired path network problem.

NOTE:
Under certain circumstances network errors can be against the ATM EI board.

d **Error Type 769** — ATM CLP (Cell Loss Priority) Bit Errors

The ATM cell header has a bit called the cell loss priority (CLP) bit. The bit indicates one of two states: the cell is eligible for discarding, or it is not. In an ATM configuration, every cell is transmitted into the ATM network with the CLP bit set to 0 indicating that these cells are NOT eligible for discarding. Should the system ever receive a cell from the ATM network with the CLP bit set to 1 (discard eligible), an entity in the ATM network modified the bit during transit. Generally, an ATM network switch sets the CLP bit to 1 (discard eligible) only if the cell fails to conform to the cell rate specified in the traffic contract for the VC. However, Communication Manager cell emissions conform with the VC traffic contract. Therefore, the presence of a non-conforming cell implies that something else in the ATM network switch is setting the CLP bit in some cells, the ATM switch can also be policing out (discarding) cells which do not conform to the traffic contract. This error can occur together with other errors such as:

"Excessive AAL-5 CRC errors" or
"Excessive LAP-D retransmissions"

These errors affect SVCs with Variable Bit Rate (VBRnt) traffic contracts. VBR SVCs transport system links such as EAL, PACL, and PRI links. Again, this indicates problems with cell transmissions in the ATM network.

If cell discard is happening generically in the ATM network, other symptoms can affect the Constant Bit Rate (CBR) SVCs including audible artifacts in talk paths, failure of modems over voice lines, and "Cell Underruns" - see note (f).

e **Error Type 1025** — ATM Congestion Bit Errors

The ATM cell header has a bit called the congestion bit. In Communication Manager ATM, every cell is transmitted into the ATM network with the congestion bit set to 0 (congestion not experienced). Should the system ever receive a cell from the ATM network with the congestion bit set to 1 (congestion experienced), an entity in the ATM network modified the bit during transit. It simply indicates that the ATM network is experiencing heavy traffic.

During periods of congestion, the ATM network can choose to discard cells even though those cells conform to their traffic contracts. Should the ATM network discard cells, errors such as the following can occur:

"Excessive AAL-5 CRC errors"
"Excessive LAP-D retransmissions".

These errors affect SVCs with Variable Bit Rate (VBRnt) traffic contracts. VBR SVCs transport system links such as EAL, PACL, and PRI links. Symptoms that can affect the Constant Bit Rate (CBR) SVCs include audible artifacts in talk paths, failure of modems over voice lines, and "cell Underruns" – see note (f).

f **Error Type 1281** — ATM Cell Underruns

Communication Manager ATM monitors for cell underrun conditions on SVCs with Constant Bit Rate (CBR) traffic contracts or on ATM CES trunks. In either case, cells are expected to arrive at a fixed rate. If cells arrive below that rate, an underrun condition exists. The most likely cause of cell underruns is a problem with cell transmission through the ATM network.

Possible symptoms include audible artifacts in talk paths and failure of modems over voice lines. If cell loss is happening generically in the ATM network, other symptoms like “excessive AAL-5 CRC errors” or “excessive LAP-D retransmissions” are possible on SVCs with Variable Bit Rate (VBRnt) traffic contracts. The VBR SVCs transport system links such as EAL, PACL, and PRI links.

Another ATM board within the system originally generated the arriving cells at the specified traffic contract rate. In order to have arrived at a lower rate, these cells were either slowed during transmission or possibly discarded by the ATM network. This indicates problems with cell transmission in the ATM network. Consult the ATM network vendor. Ask about cell delay variation, cell discard, and traffic policing.

Cell underruns often happen in conjunction with cell overruns. If both occur, it further indicts the ATM network.

g **Error Type 1537** — ATM Cell Overruns

Communication Manager ATM monitors for cell overrun conditions on SVCs with Constant Bit Rate (CBR) traffic contracts or on ATM CES trunks. In either case, cells are expected to arrive at a fixed rate. If cells arrive above that rate, an overrun condition exists. The most likely cause of cell overruns is a problem with cell transmission through the ATM network.

Both cell underruns and overruns are typical symptoms of cell transmission problems like cell jitter or delay. The ATM board attempts to compensate somewhat by buffering cells. However, if the ATM network transmission delays are high, the board could conclude that it has seen a cell overrun because it has exhausted all of its buffer space.

If cell underruns or both cell underruns and overruns occur, indict the ATM network. Consult the ATM vendor. Ask about cell delay variation, cell discard, and traffic policing.

Another much less likely cause of cell overruns is that an ATM board is generating cells above the traffic contract rate. Suppose, a board somehow generates cells too quickly. The ATM network likely reacts by at least setting the CLP bit in the cells that exceed the traffic contract (see note (d) for ATM CLP errors). The ATM network can also discard the excess cells.

If only cell overruns occur, locate the ATM board generating those cells. Execute **test board long**. If the board passes, then the ATM network remains the likely cause of transmission problems. Consult the ATM network vendor. Ask about cell delay variation, cell discard, and traffic policing.

h **Error Type 1793** — ATM lost cells:

The ATM board receiving the CBR cell stream is detecting out-of-sequence AAL1 sequence numbers, above the defined threshold. This normally indicates that the ATM network has lost the missing cells. In this case, “lost” could mean that the cells were, for example, policed out, lost to congestion, or misdirected to another endpoint.

The likely user-visible symptoms of lost cells are missing talk paths or poor voice quality.

The “lost cells” error can help you diagnose cell underrun problems. When cell underruns are accompanied by lost cells errors, the lost cells could have caused the underruns. But if you have cell under runs without lost cells, it could indicate that the underruns were due to network jitter instead. It is also possible that network jitter can cause both cell underruns and lost cells, if the jitter is so severe it causes the cells to violate their traffic contract.

When accompanied by congestion or CLP errors, the congestion or CLP can be causing the lost cells.

When accompanied by cell overrun errors, the cell overruns can be causing the TN2305 to discard cells, which in turn can show up as lost cells.

Lost cells without other errors can indicate that cells are being corrupted, especially the AAL1 sequence number.

In any case, consult your ATM network vendor about possible causes. Look for jitter (cell delay variation), cell discard, and traffic policing.

ATM PNC-DUP (ATM PNC Duplication)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PNC-DUP	NA	**status pnc**	PNC duplication

The PNC-DUP MO tracks the health of the active and standby PNCs, controls planned and spontaneous interchanges, and manages related functions such as double call refresh and unrefresh, antithrashing, and so on. The main responsibility of PNC-DUP is to recover the system to full service in the event of a fault. In the event of multiple faults, PNC-DUP does its best to maximize service continuity.

NOTE:
ATM PNC-DUP behaves differently when the system is running the ATM PNC feature. While not a separate MO, this discussion explains the unique behavior of PNC-DUP under the ATM PNC feature.

In critical-reliability systems, the following components comprising the port-network connectivity (PNC), are duplicated:

- ATM-Expansion Interface (ATM-EI) circuit packs in port networks (PNs)
- Fiber-optic cables connecting the above circuit packs to the ATM Switch Interface Modules
- ATM Switch

Although not part of the PNC, Tone-Clock circuit packs are also duplicated in each PN. ATM PNC systems can have up to 64 PNs.

PNC duplication architecture utilizes an active/standby duplication scheme in which one complete set of PNC components supports call processing, while the duplicate PNC is held in reserve. All calls on the active PNC are simultaneously set up, or shadowed, on the standby PNC in order for it to be capable of instantly assuming active status when necessary, allowing for interchanges without service disruption (in the case of single faults).

PNC duplication does not introduce any additional types of hardware or hardware faults, and there are no tests associated with the PNC-DUP MO. Instead, its error log entries contain useful information about the occurrence and causes of interchanges in order to facilitate diagnosis of problems, which can then be addressed by using the documentation for the individual MO involved.

PNC-DUP Related Commands

The following commands and their output forms are fully described in Chapter 1, "Maintenance SAT Commands" in Maintenance Commands Reference (555-245-101).

status pnc	Displays information about both PNCs' operational status, including state of health, alarms, busyouts and locks, and so on.
reset pnc interchange	Used to initiate a demand PNC interchange. If the standby is healthy (all-zero state-of-health indexes), there is no effect on service. Otherwise, calls may be dropped.
set pnc	Used to lock or unlock the active PNC, preventing interchanges. It does not interfere with double call setup.
busyout pnc	Removes the standby PNC from service. See also the following section on busyout of PNC components.

Busyouts and PNC-DUP

Busyout pnc puts the standby PNC in the busyout state. In this condition:

- Double call set up is turned off.
- The standby PNC is unrefreshed; existing duplicate call connections are removed.
- PNC interchanges are prevented.

Upon release, interchanges are re-enabled and a global refresh of double call setup on the standby is performed.

When PNC duplication is in effect:

- An active PNC component cannot be busied-out.
- A standby PNC component can only be busied-out when the standby PNC is first busied-out.
- The standby PNC cannot be released unless all standby PNC components are released.

Enabling and Removing PNC Duplication

To Enable PNC Duplication

To enable PNC duplication, perform the following sequence of steps:

1. Enable administration of PNC-DUP on the ***change system-parameters customer-options*** screen.
2. Fully administer duplicate ATM PNC connectivity. Verify by **list atm pnc**. Or for IP duplication, go to step three.
3. Fully administer IPSI duplication (**ipserver-interface duplication**). Verify by using **list ipserver-interface**.
4. Activate PNC-DUP through the ***change system-parameters duplication*** screen. This is not allowed if any component of either PNC (A or B) is busied out.

5 The system must insert all connectivity-related components for both standby and active PNC, a process that takes up to 5 minutes, depending upon circuit pack insertion. The process finishes when the first terminal login prompt appears.

6 The PNC-DUP initialization anti-thrashing timer must expire (this occurs 5 minutes after completion of board insertion, PNC interchange, or system reset of level 2 or higher).

To Disable PNC Duplication

To disable PNC duplication perform the following sequence of steps:

1 Verify that the A-PNC is active. A forced interchange may be required. See **reset pnc**.

2 Busyout the standby PNC (B-PNC).

3 Turn off the system parameter for PNC-DUP through **change system-parameters duplication**.

4 Remove the B-PNC connectivity by removing the Board Locations on the ***change fiber*** screen for ATM PNC.

5 Remove the B-PNC circuit packs (ATM-EI boards). Use **change circuit-pack *location***.

6 Disable administration of PNC duplication on the ***change system-parameters customer-options*** screen by changing the `PNC Duplication` field to **n**.

Notes:

- Alterations to PNC that involve only the *addition* of connectivity can be done with PNC-DUP operational.
- Alterations requiring the *removal* of connectivity must be done with PNC-DUP removed.
- PNC-DUP must be removed and translations should be saved before making any hardware changes.

Steady State LEDs

The LEDs of PNC components in a stable duplicated system should appear as follows:

- For an ***active*** ATM EI (functioning as Archangel) in a PN ***without*** IPSIs, its amber LED's flash pattern is 2 seconds on/200 ms off.
- For a ***standby*** ATM EI in a PN without IPSIs, it's amber LED is off.
- For an ***active*** ATM EI in a PN ***with*** IPSIs, its amber LED is on steady.
- For an ***standby*** ATM EI in a PN with IPSIs, its amber LED is off.

PNC State of Health

PNC-DUP software monitors the health of the two PNCs as determined by their state-of-health (SOH) vectors, and initiates an interchange when the health of the active falls below that of the standby (unless prevented from doing so by a PNC lock, busyout, or antithrashing mechanism). Potentially service-disrupting faults that occur in a PNC's components are reported to PNC-DUP and incorporated in the affected PNC's state of health. The SOHs of both PNCs are displayed on the **status pnc** screen, as shown in Figure 30, Status PNC screen with standby PNC fully In-Service, on page 422.

Figure 30: Status PNC screen with standby PNC fully In-Service

```
status pnc                                                  page 1 of 1

                          PORT-NETWORK CONNECTIVITY


                             Duplicated? yes
                          Software Locked? no
                           Standby Busied? no

                        Standby Refreshed? yes
                     Interchange Disabled? no


              A-PNC                              B-PNC

            Mode: active                       Mode: standby
  State of Health: functional        State of Health: functional

   Inter PN Index: 00.00.00.00            Inter PN Index: 00.00.00.00

     Major Alarms: 0                    Major Alarms: 0
     Minor Alarms: 0                    Minor Alarms: 0
   Warning Alarms: 0                  Warning Alarms: 0
```

PNC State-of-Health Indexes

The Inter-PN Index screen the state-of-health vector is used to track and compare the states of health of both PNCs. The fields making up the indexes are 2-digit numbers separated by periods (.), with each field representing a different class of faults. The fault class fields are arranged in order of decreasing importance from left to right. In other words, each field in the index supersedes the following fields in determining which PNC is healthiest. A fault class drives an interchange only when all of the higher priority fault classes are equal. A zero entry indicates no faults present for that class. Increasing numbers indicate increasingly higher numbers of faults present in that class.

The Inter-PN Index contains four fields (XX.XX.XX.XX). The Inter-PN Index reports faults in connectivity between PNs.

- The meaning of each fault class field is given in Table 175, PNC State-of-Health Fault Classes, on page 423.
- A zero entry indicates that there are no faults reported.
- Higher numbers indicate increasing number of faults.
- All zeros indicate a perfect state of health.
- Unless the PNCs are locked, the active PNC's state of health should always be equal to or better than the standby's. Otherwise, the system performs a spontaneous interchange.

After a PNC-related alarm is cleared, the system performs a partial refresh of the standby PNC. The corresponding fault class field is not updated to reflect the improved state of health until the refresh is done. The state-of-health indexes do not agree with the current alarm status during this period.

Table 175: PNC State-of-Health Fault Classes

Fault Class	Priority	Description	MOs
FC_EAL	1	Number of PNs with EALs down	EXP-PN
FC_PACL	2	Number of PNs with LINL, RINL, or EI-SNI neighbor link faults	EXP-PN
FC_BFD	3	Number of PNs with BFDL (Bearer Fault Detection Link) faults	SYS-LINK
FC_HW	4	Number of PNs affected by hardware faults in a link having an EI as an endpoint. Use **list atm pnc** to see endpoint designations.	ATM-EI

Resolving Poor State of Health

When both PNCs do not have an all-zero SOH (perfect health), use the following steps to identify and repair the problem.

1. Look for PNC component alarms (major or minor) for the PNC side without an all-zero SOH. The standby PNC should be repaired first.
2. Busy-out the standby PNC.
3. Follow the appropriate diagnostic and repair procedures for the alarmed PNC components just as with a simplex PNC. Both the alarm and error logs should be examined to isolate the fault.
4. Verify that the related PNC's SOH is restored to all zeros.
5. Release the standby PNC.

Refresh and Unrefresh of the Standby PNC

In a fully-functional PNC with healthy standby and active sides, the standby PNC has a complete set of call connections corresponding to those in the active PNC. If, however, the standby PNC's state of health degrades, a selective unrefresh of those connections that utilize the faulted component(s) is performed. If the standby PNC's health improves, a selective refresh of connections on the affected route is performed so that call setup is consistent between the active PNC and the healthy parts of the standby PNC.

The `Standby Refreshed?` field on the **status pnc** screen does *not* refer to the selective type of refresh. It refers only to a global refresh that is performed when:

- The system is initialized and PNC duplication is enabled.
- There has been a spontaneous PNC interchange.
- The standby PNC has been released from busy-out.
- A system reset of level 2 or higher has taken place.

The `Refreshed` field may display `yes` when in fact the standby is partially unrefreshed. An interchange into an incompletely refreshed standby results in dropped calls. This can happen when a more severe fault occurs on the active PNC or when **reset pnc interchange** is used with the override option.

PNC Interchanges

PNC spontaneous interchanges occur when PNC duplication software determines that the standby PNC's state of health (SOH) surpasses the active PNC's.

- PNC-DUP executes a spontaneous interchange in response to a message from a PNC component MO indicating that either a fault has occurred on the active PNC or a fault has been resolved on the standby PNC.
- The PNC SOH is compared to the standby PNC, and an interchange occurs if the standby PNC's state of health surpasses the active PNC's.
- A corresponding Major or Minor alarm is logged by the reporting MO, stimulating an alarm report.

When the resolution of a fault on the standby renders it more healthy than a simultaneously-faulted active PNC, the error message indicates the type and location of the *improved* component.

Once the interchange completes, the failed component is on the standby PNC. A demand interchange can be requested in the presence or absence of standby PNC faults. The following sequence of actions can be observed during a fault-free interchange:

1. The ATM-Expansion Interfaces currently acting as archangels in the PNs are deactivated as indicated by the amber LEDs going from flashing to on solid.
2. The ATM-EIs in IPSI-connected PNs are interchanged, indicated by the new standby ATM-EI amber LED off and the new active ATM-EI amber LED on steady.
3. One by one, the ATM-EIs in non-IPSI-connected PNs are interchanged as indicated by new standby ATM-EI amber LED turning off and the new active ATM-EI amber LED flashing (2 seconds on / 200 milliseconds off). At this point, the interchange is functionally complete.

Certain conditions may interfere with the normal execution of the interchange:

1. In a faulted spontaneous interchange, it is possible the PN(s) directly affected by the fault will be the last to interchange.
2. A user directly affected by the single fault instigating a PNC interchange can experience a momentary voice path outage during the switch.
3. If faults exist on both the standby and active PNC, it is possible to have some PNs go out of service while others are returned to service.

In any multifault situation, rely on **status pnc** to determine which is the active PNC.

PNC duplication informs Timing Synchronization maintenance when a PNC interchange has been completed and indicates which PNC is active. This causes Synchronization to audit and ensure that the primary source for synchronization of Tone-Clocks in each PN is supplied by a path associated with the active PNC.

Antithrashing and PNC Interchanges

Following a spontaneous PNC interchange, subsequent PNC interchanges are prevented for 5 minutes. This condition is indicated by **y** in the `Interchange Disabled?` field of the **status pnc** screen. After 5 minutes, the antithrashing timer expires, interchange decisions are re-enabled, and the field displays **n**.

NOTE:
Should a catastrophic failure occur on the active PNC during the period when the `Interchange Disabled?` *field is set to "yes," there will be no spontaneous PNC interchange.*

Demand PNC interchanges also invoke anti-thrashing, but only for a period of 30 seconds. During antithrashing mode, demand interchanges are also prevented unless the override option is specified.

CAUTION:
Use of this option may cause a service disruption.

Repairs on the Standby PNC Components

CAUTION:
If there is a TDM-CLK alarm, system timing may be routed through part of the standby PNC, and circuit switched data may be affected by the following repair procedures. This can happen, for example, when a slave tone/clock circuit pack experiences a loss of signal and switches to receive timing from the standby ATM-EI. In this case TDM-CLK 2305 error is logged, and the clock problem should be addressed first, if possible.

To repair PNC components in a duplicated PNC proceed as follows:

1. Most repairs involve fixing a single fault on the standby PNC. Use **set pnc lock** or **busy-out pnc** to prevent an interchange into the PNC being repaired.
2. If a faulty component exists on the active PNC, this also means that the standby PNC is more severely faulted. Normally, the *standby* PNC is repaired first, since it is the most severely impaired.

   To repair the active PNC (standby is already repaired), issue the **set pnc unlock** command, which generates a spontaneous interchange. In a PNC demand interchange with **reset pnc interchange** use the ***override-and-lock*** qualifier for the active PNC. The ***override-and-lock*** option ensures that no subsequent interchange can occur during the repair of the standby PNC. A demand interchange may not be necessary if the following conditions drive a spontaneous interchange:

   - The anti-thrashing period from the last interchange has expired.
   - The global refresh from releasing the standby PNC has completed.
   - The standby PNC's state of health surpasses the active PNC's.

   At this point, the faulty component is on the standby PNC, and the PNCs are locked in their current active/standby state.
3. Busyout the PNC with the **busyout pnc** command.
4. Use fault isolation and component testing procedures for the individual PNC components, just as for a simplex PNC. Replacement of components does disrupt operation of the active PNC.

5 Once the failed component is replaced, use the **status pnc** command to check the health standby PNC component.

6 When confident that the problem has been resolved, as indicated by an all-zero state of health, unlock (**set pnc unlock**) and release (**release pnc**) the PNC. Note that no further PNC interchange is required since you can test the standby PNC as thoroughly as the active.

Interactions: Server Resets and PNC Interchanges

- A system reset of level 1 (warm), 2 (cold2) or 4 (reboot) does not change which PNC is active. If a PNC interchange was in progress when the reset took place, the PNC interchange continued until completion.
- If a **reset system 1** (warm) takes place during a PNC interchange, the reset is escalated to level 2 (cold2).

Fault Isolation Using Duplicated PNC

In some cases, PNC duplication can aid in the fault isolation procedure. PNC interchanges can be used to help isolate the faulty hardware. Two examples demonstrating this technique follow:

1 There is a fault that can occur in either an IPSI-connected PN's ATM-EI or the PKT-INT which cannot be readily attributed to one board or the other. If the packet bus transceivers on either the PKT-INT or ATM-EI fail, the two boards cannot communicate, but it will not be clear which board is at fault. In this case, a planned interchange of the PNC can be used to indicate which of the two boards. If the interchange:

   — Cures the problem, the ATM-EI was at fault

   — Does not cure the problem, the PKT-INT is suspect (provided there are no PKT-BUS faults)

2 A similar relationship exists for the PN Archangel (EAA - the active ATM-EI) and certain TDM-bus problems. If the EAA is unable to communicate with a port board over the TDM bus, either the EAA has a fault, the port board has a fault, or there is a problem with the TDM bus itself. If TDM bus maintenance tests find no problems with the bus, then it is either the port board or the EAA. It may be simpler to replace the port board than to request a PNC interchange. However, if it is not clear which port board may be at fault or maintenance is being performed remotely, verify that the EAA is not at fault by executing a PNC interchange. If the interchange solves the problem, then the EAA is faulty. If the problem persists after the interchange, but TDM bus maintenance finds no problem, then the port board is faulty.

Error Log Entries

Whenever a PNC interchange takes place, an error is logged against PNC-DUP with a code that conveys information about the cause of the interchange and which PNC became active. There are no alarms associated with PNC-DUP errors, but there should be an alarm against the PNC component that caused the interchange. There are no PNC-DUP test sequences, but **status pnc** provides information regarding the status of the PNCs. The information in Table 92, Test #35 Battery Feed Test, on page 239 and Table 177, Error Log Encode Field Decoding, on page 427 can help to identify which areas of the Alarm Log to investigate to find the source of the problem.

Table 176: Error Code descriptions and Aux Data correlations

Error Code	Description	Aux Data[1]
00000	Error in generating error code	None
1cxpp	Spontaneous Interchange in response to a constraint for A-PNC	Active PNC
2cxpp	Spontaneous Interchange in response to a constraint for B-PNC	Active PNC
51000	Spontaneous Interchange at expiration of SOH validation timer	Active PNC
52000	Spontaneous Interchange upon PNC UNLOCK	Active PNC
53000	Spontaneous Interchange at completion of Global Refresh	Active PNC
60801	PNC Demand Interchange	Active PNC
60800	PNC Demand Interchange with override	Active PNC

1 The Aux Data indicates which PNC became active after the PNC interchange: “0” denotes PNC-A; “1” denotes PNC-B.

Table 177: Error Log Encode Field Decoding

Field	Variable Name	Values	Description
c	Alarm Type	0 1	Alarm retired MAJOR or MINOR alarm on any PNC component
x	Fault class; see description for contributing MOs	0	EAL (Expansion Archangel Link - EXP-PN) carries CCMS messages
		1	PACL (ATM-EI) carries ATM signaling commands from Call Processing to the remote ATM-EI circuit packs
		2	PNC hardware (providing connectivity of PN-to-PN or -ATM-EI)
		5	BFDL (bearer fault detection link) solely for the purpose of detecting bearer faults
pp	Port-network number	0–63	0–2 for constraint class (this is an internal number; add 1 for external port number)

Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
18	None	**busy PNC-DUP**	WARNING	ON	**release pnc-dup**

NOTE:
The **list config port-network** command shows the cabinet number associated with a PN.

ATM-SGRP (ATM Signaling Group)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-SGRP	MINOR	**test sig-group *grp#***	ATM-CES Signaling Group
ATM-SGRP	WARNING	**test sig-group *grp#***	ATM-CES Signaling Group

1 ***grp#*** is the signaling group number (1–166); the test sequence can be either short or long.

This ATM-SGRP MO applies when ATM signaling groups have been administered on an ATM circuit pack as ATM trunks.

Table 178, R7 ATM-SGR circuit packs, on page 429 outlines the differences between ATM interface circuit packs:

Table 178: R7 ATM-SGR circuit packs

Circuit pack	Channel types	Interface	Fiber	Echo cancellation
TN2305	B and D channels	24- or 32-channel	Multimode	Y
TN2306	B and D channels	24- or 32-channel	Single-mode	Y

The TN2305 and TN2306 ATM Interface circuit boards are referred to as TN230X for the remainder of this MO.

An ATM Signaling Group is a collection of B channels for which a given ISDN-PRI signaling-channel port (ATM D channel) carries signaling information. ATM B channels (ATM-BCH) carry voice or data and are assigned to ISDN trunks. For more information see ATM-TRK (Circuit Emulation Service Circuit Pack) on page 445.

The operation of the entire ATM signaling group depends on several other entities:

- ATM-DCH signaling-channel port
- TN230X Interface circuit pack where a D channel resides
- System link to the processor via the packet bus

When there are problems with ATM-SGRP (ATM signaling group), also investigate:

- ATM-DCH (ATM D-Channel Port)
- ATM-BCH (ATM B-Channel Trunk)
- SYS-LINK (System Links)
- PKT-BUS (Packet Bus)

Error Log Entries and Test to Clear Values

Table 179: ATM-SGRP Signaling Group Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/ Off Board	Test to Clear Value
0	0	Any	Any		**test sig-group *grp#***
1 (a)	Any	None			
18 (b)		MO busied out			
257 (c)	Any	None			**test sig-group *grp#***
769 (d)	Any	Primary Signaling Link Hardware check (#636)			**test sig-group *grp#***
1281 (e)	Any	Secondary Signaling Link Hardware check (#639)			**test sig-group *grp#***
1793 (f)	Any	Layer 2 Status test (#647)	WARNING	OFF	**test sig-group *grp#***
2305 (g)	Any	Remote Layer 3 Query test (#637)	MINOR	OFF	**test sig-group *grp#***
3585 (h)	Port number	None			
3840 - 3928 (i)	Port number	None			

Notes

a Error Type 1: switch sent a message to the far-end switch or terminal adapter, and the far end did not respond in the allotted time. Possible causes include link failure and congestion or outage at the far end. The Aux Data field contains layer-3 protocol information used by internal counters.

If no other symptoms are present, no action is required. If layer-3 communication is down:

a Check for alarms and errors against link components

b Check out other errors against ATM-SGRP, ATM-TRK, and other hardware components on the link.

There is no test to clear these errors. The error counter is decremented by 1 every 15 minutes.

b Error Type 18: the ATM circuit pack has been busied out (either **busyout atm sig-grp** or **busyout board *locaation***).

1 Release the ATM signaling group (**release atm sig-grp**) or the circuit pack (**release board *UUCSS***).

c Error Type 257: the primary signaling channel connection has been lost for more than 90 seconds.

- The associated B channels are placed in the ISDN Maintenance/Far-End state.
- The B channels are not usable for outgoing calls, although incoming calls can be accepted.
- The switch automatically attempts to recover the signaling link.

1 Pay particular attention to the results of Test #636 (Primary Signaling Link Hardware Check) in the test sequence.

- When the link does recover, the B channels are negotiated back to the In-Service state and their alarms are retired.

2 When this error occurs, the state of the Signaling Group is changed to out-of-service (verify using the **status sig-group** command).

d Error Type 769: signaling link hardware error.
Service-affecting failures of the hardware used to transport the D channel are reported to the ATM CES Signaling Group MO. Maintenance logs this error, places the D channel into the OOS state, and raises a board-level alarm. The D channel is returned to service, and the alarm is retired once the hardware failure condition clears.

e Error Type 1281: Degraded PVC alarms indicate that a particular Permanent Virtual Circuit, or signaling group, has encountered sufficient errors to exceed firmware thresholds. Operations can continue but at a lower level of reliability or performance. Firmware filters these alarms so that only one is reported active at a given time. The following in-line error is considered a Degraded PVC alarm:

- Excessive AAL – The AAL layer is experiencing an excessive number of errors in trying to reconstruct Service Data Units (SDUs). Possible causes:
  - Problem with the ATM switch
  - Noisy communication paths on opposite side of ATM switch
  - Unhealthy sending node
  - Congestion at the ATM switch

f Error Type 1793: Layer 2 Query test for the primary signaling channel failed.

- Excessive AAL – The AAL layer is experiencing an excessive number of errors in trying to reconstruct Service Data Unit (SDUs). Possible causes:
  - Problem with the ATM switch
  - Noisy communication paths on opposite side of ATM switch
  - Unhealthy sending node
  - Congestion at the ATM switch

g Error Type 2305: The Remote Layer 3 Query test (#637) failed. A specific message was sent to the far-end switch, and it did not respond within the allotted time.

1 Investigate elements of the ATM D channel(s) (ATM-DCH) for both this switch and the far-end switch.

If Test #637 fails twice in a row, the B channels are alarmed and made unavailable for outgoing calls (although incoming calls are still accepted). When Test #637 succeeds and the far-end switch starts responding properly, the ATM trunk (B channels) are placed back into normal operation and their alarms retired.

h Error Type 3585: A SERV or SERV ACK ISDN D-channel message has been received by a non-US-type interface (country option other than `1` on the DS1 administration screen). However, these messages are used only for duplex NFAS signaling, which is supported by country protocol 1.

Thus, there may be a mismatch in administration between the local and far-end switches.

1 Consult with the customer's network provider to determine whether the D channel is set up correctly on the far-end switch.

i Error Type 3840-3928: These error types are used to report certain error messages received by the ATM-SGRP Signaling Group for one of its associated B channels. The Aux Data field is the port number of the B channel from which the message was received.

The error code generated equals 3840+*x*, where *x* is a Cause Value defined by the ISDN PRI Specification. Note that there is no Test to Clear Value for these error types; selected ISDN cause values are placed in the log when they are received, but no direct action or alarming is performed solely in response to receiving them. They provide added data that may prove useful when tracking down obscure networking and routing problems. Table 180, Descriptions and repair recommendations (Error Types 3840-3928), on page 432 provides more information about this range of Error Codes:

Table 180: Descriptions and repair recommendations (Error Types 3840-3928)

Error Code	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cannot be accessed.	From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. **1** Check every routing pattern containing this trunk group for validity of interexchange carriers requested (IXC field).
3846	The far-end switch has indicated that the B channel (trunk) is not acceptable for use in the call for which it was requested.	This could indicate • an administration problem (for example, the local switch and the far-end switch have different B channels administered) • a normal race condition (for example, the local switch has requested use of a B channel that the far-end switch had just reserved for use on another call). **1** From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. **2** Issue **status trunk** for the indicated trunk. **3** Refer to Table 141, ATM ISDN service states, on page 352 for recovery suggestions.
3858	Similar to Error Type 1. The switch sent an ISDN message to the far-end switch or terminal adapter that did not respond in the allotted time.	**1** Check for alarms and errors against link components **2** Check out other errors against ATM-SGRP (ATM Signaling Group), ATM-TRK (Circuit Emulation Service Circuit Pack), and other hardware components on the link.
3878	The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful).	**1** From the circuit pack and port number (in the Aux Data field, determine the trunk group against which the error was reported. **2** Consult with the network provider to determine the nature and expected duration of the out of service condition. **3** Consider modifying every routing pattern containing this trunk group, to route calls around the network that is out of service.

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Table 180: Descriptions and repair recommendations (Error Types 3840-3928)

Error Code	Description	Recommendation
3890	A request to use a network service (for example, SDN) has been denied. Administration somewhere in the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could indicate • a local administration problem • a mismatch between the local administration and that of the network provider. **1** From the circuit pack and port number (in the Aux Data field), determine the trunk group against which the error was reported. **2** Display the trunk group screen. If the trunk group is Call-by-Call (the `Service Type` field is `cbc`), check every routing pattern screen containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the `Service Type` field contains the single network service purchased for this trunk. **3** If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	**1** If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	**1** Eliminate any transitory state mismatch problems (**test port *location*** for the trunk port shown in the Aux Data field). Test #256 (Service State Audit) is the important test in the sequence. **2** If Test #256 passes yet the customer continues to complain of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	**1** If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.

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Table 180: Descriptions and repair recommendations (Error Types 3840-3928)

Error Code	Description	Recommendation
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	**1** If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	**1** Follow the recommendations listed above for Error Type 3890.
3928	A call was denied because of a basic incompatibility between the type of call and either the facilities selected by the routing pattern or the called user itself.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone after accessing ISDN trunks or PRI endpoints. **1** Determine the trunk group from the circuit pack and port number (in the aux data field) **2** check the BCC fields of the pertinent routing patterns. **3** Also, investigate whether or not the calling and called endpoints are compatible (for example, some ISDN switches may not allow a voice station to call a data extension).

3 of 3

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Primary Signaling Link Hardware* check (#636), you may also clear errors generated from other tests in the testing sequence.

Table 181: System Technician-Demanded Tests: ATM-SGRP

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Primary Signaling Link Hardware check (#636)	X	X	ND
Layer 2 Status test (#647)	X	X	ND
Remote Layer 3 Query test (#1291)	X	X	ND

1 D = Destructive, ND = Nondestructive

Primary Signaling Link Hardware Check (#636)

The ATM-SGRP Signaling Group D-channel port depends on the health of the TN230X interface circuit pack on which it resides. This test fails if there are problems with either the ATM-DCH (D-channel port) MO or the TN230X circuit pack. Investigate the ATM TN230X circuit pack (ATM-TRK) anytime there are problems with the ATM D-channel port (ATM-DCH).

Table 182: Primary Signaling Link Hardware Check (#636)

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals up to 5 times.
8	FAIL	There is a problem with the ATM TN230X circuit pack or the ATM signaling channel (D channel), preventing any ISDN trunk calls until the problem is resolved. **1** Consult the procedures for the TN230X circuit pack (ATM-TRK) and the ATM D channel (ATM-DCH).
	PASS	The basic physical connectivity of the D channel is intact and functional. **1** Try this test repeatedly to ensure the link is up and to uncover any transitory problems.

Layer 2 Status Test (#647)

The Layer 2 Status test checks the layer-2 status of the ATM-SRG signaling channel (D channel). This test fails when:

- there is a hardware failure
- there is a facility problem
- the D channels are not administered correctly

The Signaling Link Hardware Check (Test #637) and the Remote Layer 3 Query test (#1291) detects most problems caused by hardware failures or incorrect administration.

Table 183: Test #647 Layer 2 Status Query Test

Error Code	Test Result	Description / Recommendation
1132	ABORT	Internal system error. The port location for the D channel is not known. This condition should not be possible since an administered ATM circuit pack must be specified when a Signaling Group is administered: **1** Retry the command at 1-minute intervals up to five times.

1 of 2

Table 183: Test #647 Layer 2 Status Query Test

Error Code	Test Result	Description / Recommendation
1134	ABORT	Internal system error. The associated ATM circuit pack is not administered. This condition should not be possible, since an administered ATM circuit pack must be specified when administering a Signaling Group. **1** Retry the command at 1-minute intervals up to three times.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to five times.
1	FAIL	Layer 2 of the signaling channel is down. **1** Examine the results of the Signaling test (#636), and follow recommendations provided there. **2** If Test #636 (Primary Signaling Link Hardware Check) passes, the Layer 2 Query test may still fail if the signaling channel at the far end has not been administered correctly or if the signaling channel has been busied out. **3** Verify that the far-end signaling channel (D channel) has been administered correctly. **4** Verify that the ATM-DCH port used for the D channel has not been busied out at the far end.
3	FAIL	The D channel is down. **1** Examine the results of the Primary Signaling Link Hardware Check (#636) and follow recommendations provided there. **2** If Test #636 (Primary Signaling Link Hardware Check) passes, the Layer 2 Query test may still fail if the signaling channel at the far end has not been administered correctly or if the signaling channel has been busied out. **3** Verify that the far-end signaling channel (D channel) has been administered correctly. **4** Verify that the far-end ATM-DCH ports used for the Primary and Secondary D channels have not been busied out.
	PASS	The Primary signaling channel is up.

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Remote Layer 3 Query (#1291)

This test queries the far-end switch or terminal adapter to determine whether the signaling connection is functioning properly at Layer 3. It selects a B channel in the in-service or maintenance service state and sends an ISDN layer-3 SERVice message, which requires a response from the far end (similar to performing Test #256 on an ISDN trunk). The test is not performed if there are no B channels in an appropriate ISDN service state (for example, when none are administered or they are all out of service).

NOTE:
The service state can be displayed by using the **status trunk *trunk-group/trunk-member*** or **status pri-endpoint** command.

As is the case with Test #256 for an ISDN trunk, a PASS only indicates that a message was composed and sent to the far-end switch or terminal adapter. The ISDN PRI Specification allows up to 2 minutes for a response. Check the Error Log for ATM-SGRP errors of type 2305 for evidence of a Remote Layer 3 Query failure.

Test #636 checks the health of the D channels and ATM Interface circuit packs. This test goes one step further by checking the communication path from the processor, through the TDM/packet bus and ATM Interface circuit pack, and on to the far-end switch or terminal adapter. A special ISDN message is sent to the far-end switch or terminal adapter that must respond within a specified amount of time. This test is designed to ensure that the communication path between the switch and the far end is up and operational, and that the two endpoints can properly exchange ISDN control messages.

Table 184: Test #1291 Remote Layer 3 Query

Error Code	Test Result	Description / Recommendation
1006	ABORT	There are no associated B channels in an ISDN “in-service” or “maintenance” service state. This is a NORMAL ABORT. **1** Administer or release an ISDN trunk or PRI endpoint before retrying the test. For an ATM trunk, use **status trunk *grp#/mbr#*** to verify the ISDN trunk state. **2** Retry this test when at least one B channel is in the “in-service” or “maintenance” states.
1113	ABORT	The signaling channel is down. Therefore, no messages can be sent to the far-end switch or terminal adapter. **1** Examine the results of Test #636, and follow recommendations provided there.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2500, none	ABORT	Internal system error or administration problem **1** Determine whether any B channels are administered. **2** If there are none, then this is a normal ABORT, since this test cannot run unless at least one B channel is administered. **3** If at least one B channel is administered, there is an internal system error. Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 184: Test #1291 Remote Layer 3 Query

Error Code	Test Result	Description / Recommendation
	FAIL	Internal system error **1** See description of ABORT with Error Code 2500.
	PASS	A message was sent to the far-end switch or terminal adapter. The ISDN PRI specification allows up to 2 minutes for a reply. **1** Check the Error Log for ATM-SGRP errors of type 2305 for evidence of a Remote Layer 3 Query failure. **2** If no new errors were logged since this test was run, then this switch and the far-end switch can exchange call control messages. **3** If there is still a problem with a particular ATM trunk, busyout the trunk and run the long test sequence, paying particular attention to the results of Test #258 (ISDN test call).

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ATM-SYNC (ATM Synchronization)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ATM-SYNC	MINOR	**display errors**	ATM Synchronization
ATM-SYNC	WARNING	**test synchronization**	ATM Synchronization

This section discusses intra-switch synchronization maintenance and the hardware and software components that provide a common reference frequency for reliable digital communications among the G3r system, the ATM switch, and other PBXs, Central Offices (COs) or customer-premises equipment (CPE). Circuit packs involved in synchronization include:

NOTE:
TN768 or TN780 Tone-Clock circuit packs are not compatible with ATM EIs.

- TN2312 IPSI circuit pack's Tone-Clock circuit
- TN2182 Tone-Clock
- TN722, TN464, and TN767 DS1 Interfaces (all suffixes)
- TN2305/6 ATM Expansion Interface (multimode fiber)

Synchronization is achieved between the S8700 Media Server Multi-Connect IPSI and the port networks (PNs) through the ATM port-network connectivity (ATM PNC) between the networks. Depending on the network's synchronization plan and the status of synchronization sources, the system timing reference may be:

- The clock circuit pack on the ATM switch
- A DS1 or UDS1 interface circuit pack-tapped T1 input signal connected to the ATM switch clock circuit
- An OC-3 interface circuit pack on the ATM switch

Stratum 4 synchronization extracts timing information directly from

- A DS1 or UDS1 reference
- An OC3 reference
- The ATM switch clock

For further information about synchronization including network synchronization, refer to *AT&T Network and Data Connectivity , 555-025-201*.

Stratum 4 Synchronization

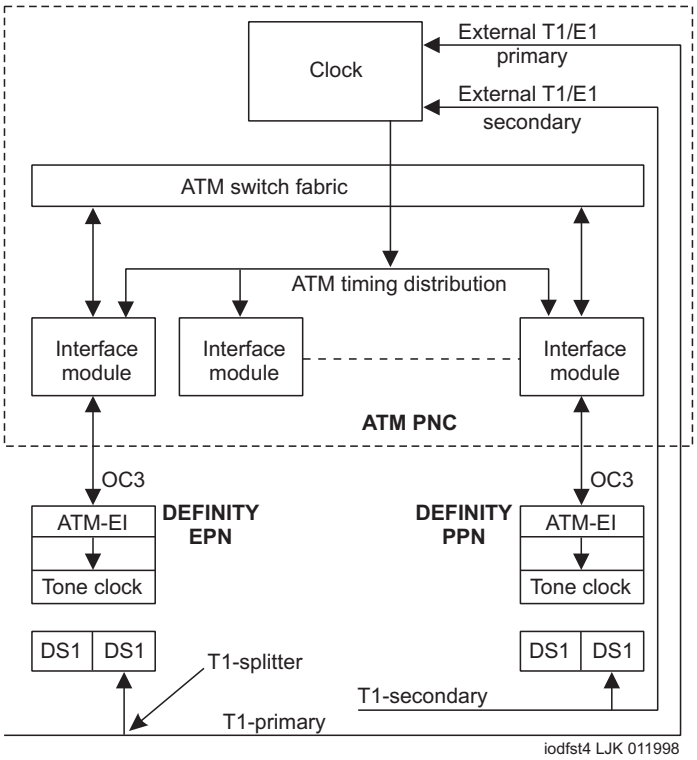
Systems may have primary and secondary synchronization references (DS1/UDS1 interface circuit packs or ATM-Switch) when using Stratum 4 synchronization.

If the primary synchronization reference in Figure 31, Stratum-4 Synchronization with Unduplicated ATM PNC, on page 440 is providing a valid timing signal, then the flow of system synchronization would travel from the DS1 interface circuit pack in the PN to the ATM switch. The primary DS1 interface circuit pack provides a timing signal for the ATM switch clock circuitry. This synchronization source is then distributed to all of its OC3 Interface Modules. Each ATM Expansion Interface circuit pack uses the received data stream from the ATM switch to generate a timing signal. The Tone-Clock circuits in the PNs use this signal to generate timing for every circuit pack in their respective PNs. All PNs, in the above mentioned scenario are designated the *slave* PNs. The ATM switch is the *master* that contains the system synchronization source. If the primary synchronization reference does not provide a valid timing signal, ATM synchronization maintenance infers a switch to the secondary reference.

If the primary synchronization reference is not providing a valid timing signal, the system automatically switches to the secondary synchronization reference. If the primary synchronization reference is invalid, and if the secondary reference does not provide a valid timing signal or is not administered as a synchronization reference, the switch infers that the local oscillator of the ATM switch provides the system timing source. If the system is using the local oscillator of the ATM switch as the system timing source because the primary and secondary references are providing invalid timing signals, when either the primary or secondary reference becomes valid again, the system switches back to the primary or secondary source. When both the primary and secondary source become valid, the system switches to the primary source, since the primary source is always preferred over the secondary source when both sources are equally healthy.

Figure 31, Stratum-4 Synchronization with Unduplicated ATM PNC, on page 440 depicts a simplex ATM PNC with T1/OC3 synchronization reference into the ATM switch.

Figure 31: Stratum-4 Synchronization with Unduplicated ATM PNC



NOTE:
The TN722 DS1 Interface circuit pack does not provide a synchronization reference as reliably as the TN767 or TN464C circuit packs. Therefore, administer the TN767 or TN464C circuit packs as the primary or secondary sources.

Stratum-3 Synchronization

Stratum-3 synchronization is not supported in S8700 Multi-Connect with ATM PNC.

Synchronization Troubleshooting

A significant part of the Synchronization Recovery Strategy for a S8700 Multi-Connect with ATM PNC resides in the ATM switch's clock hardware, firmware, and software. S8700 Multi-Connect monitors synchronization performance and alarms any faulty components. See SYNC (Port-Network Synchronization) on page 1751.

ATM-SYNC Commands

Use the following commands to help troubleshoot ATM-SYNC problems:

change synchronization	Allows primary and secondary references to be administered for the Stratum 4 option, or `ATM-Switch`, indicating that the synchronization references are input directly to the ATM switch
status synchronization	Shows the current inferred synchronization reference
status synchronization	Shows the administered primary and secondary synchronization references
list timing-source	Displays all DS1 and UDS1 locations that are allowed to be administered as primary or secondary references with the **change synchronization** command
disable/enable synchronization-switch	Prevents or allows switching to another synchronization source
test synchronization	Tests the administered synchronization source

Error Log Entries and Test to Clear Values

Table 185: Synchronization Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test synchronization**
1 (a) (g)		None	WARNING/ MINOR	OFF	None
257 (b) (g)		None	WARNING/ MINOR	OFF	None
513 (c) (g)		None	WARNING/ MAJOR	OFF	None
1537 (d)[2]		None	WARNING	OFF	None
1793 (e)[2]	0-50	None	NONE	OFF	None
2049 (f)[2]	0	None	WARNING	OFF	None

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 It may take up to 1 hour for these alarms to clear via the "leaky bucket" strategy.

Notes:

a Error Type 1: problem with the primary DS1 reference. It is cleared when the primary reference is restored. The following steps should give an indication of the source of the problem:

1 Check if the primary DS1 interface circuit pack is inserted in the carrier with the **list configuration board *location*** command.

2 Verify that the administered primary reference matches the DS1 reference from the network synchronization plan.

3 Test the primary DS1 interface circuit pack with the **test board *location* long** command. Check the Error Log for DS1-BD or UDS1-BD errors and see DS1-BD (DS1 Interface Circuit Pack) on page 760 or 'UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 to resolve any errors associated with the primary DS1 (DS1 or UDS1) interface circuit pack. If the only errors against DS1-BD or UDS1-BD are slip errors, then follow the procedures described in the troubleshooting section above. If no errors are listed in the Error Log for the primary DS1 interface circuit pack, continue with the following steps.

4 Test the active Tone-Clock circuit in the master PN with the **test tone-clock *location* long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 (TDM Bus Clock Circuit Status Inquiry test) passes successfully. If Test #148 fails with an Error Code 2 through 32, see TDM-CLK (TDM Bus Clock) on page 1847 to resolve the problem.

b Error Type 257: problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (a) to resolve this error substituting **secondary** for **primary** in the preceding resolution steps.

c Error Type 513: the ATM switch clock is inferred to be providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

d Error Type 1537: over half of the DS1s that are administered with slip detection enabled through the `Slip Detection?` field set to **y** are experiencing slips.

e Error Type 1793: inferred excessive switching of system synchronization references has occurred. When this error occurs, it is inferred that the ATM switch clock has become the synchronization reference for the system.

1. Check for timing loops and resolve any loops that exist.
2. Test the active Tone-Clock circuit in the master PN with the **test tone-clock *location* long** command.

   Check the Error Log for TDM-CLK errors, and verify that TDM Bus Clock Circuit Status Inquiry test (#148) passes successfully.

   If Test #148 fails with an Error Code 2–32, see TDM-CLK (TDM Bus Clock) on page 1847 to resolve the problem. If not, continue with the following steps.
3. *For Duplicated Tone-Clock circuit packs in the master PN:* Switch Tone-Clock circuit packs on the master PN with the **set tone-clock *location*** command.

   For Simplex Tone-Clock circuit packs in the master PN: replace the primary and secondary (if administered) DS1 Interface circuit packs.
4. Investigate any other SYNC errors.

f Error Type 2049: the ATM Expansion Interface circuit packs have errors that affect synchronization. Test the ATM Expansion Interface circuit pack with the **test board *location*** command.

This error is cleared by a “leaky bucket” strategy and takes up to one hour to clear (leak away) the error counter once it is cleared.

g Error Types 1, 257, and 513: noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a synchronization problem occurs on Error Types 1, 257, or 513, a WARNING alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MINOR or MAJOR alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented below when inspecting errors in the system.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Test Synchronization test (#417)	X	X	ND

1 D = Destructive, ND = Non-destructive

Test Synchronization Test (#417)

This test updates all the Synchronization Maintenance component circuit packs with the correct information regarding their role in providing synchronization for the system. All the Tone-Clock, ATM Expansion Interface, DS1 Interface, and UDS1 Interface circuit packs in the system are updated through this test. This test either passes or aborts.

Table 186: Test #417 Test Synchronization Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.
1115	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error
	PASS	The synchronization maintenance component circuit pack parameters have been successfully updated. The system should be synchronized after successful execution of this test. **1** If synchronization problems still exist, refer to the Error Log to obtain information regarding the source of the problem.

ATM-TRK (Circuit Emulation Service Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ATM-TRK	MAJOR	**test board *location***	ATM TRUNK (ATM Circuit Emulation Service)
ATM-TRK	MINOR	**test board *location***	ATM TRUNK (ATM Circuit Emulation Service)
ATM-TRK	WARNING	**test board *location***	ATM TRUNK (ATM Circuit Emulation Service)

1 For information on specifying a location, see Command Syntax on page 179.

This MO explains how you test and repair TN230x ATM Interface circuit packs (TN2305 and TN2306) that have been administered as virtual ISDN-PRI trunks for ATM Circuit Emulation Service (CES). The maintenance instructions for TN230x circuit packs that have been administered as Expansion Interfaces for WAN connectivity are in the ATM-INTF (TN2305/6) MO.

Description

The TN2305 and TN2306 (Table 187, R7 ATM-TRK circuit packs, on page 445) are dual-purpose ATM circuit packs that can be administered as either personality:

- ATM Circuit Emulation Service or virtual ISDN-PRI signaling trunks
- Expansion Interfaces (ATM-EIs) for port-network connectivity (ATM PNC) between the PNs

Either circuit pack "personality" requires SONET OC-3 or SDH STM-1 fiber cable connections between the circuit pack and the ATM switch. As a trunk board, it supports direct connection between ATM CES circuit packs without an intervening ATM switch.

Table 187: R7 ATM-TRK circuit packs

Circuit pack	Channel types	Interface	Fiber	Echo cancellation
TN2305	B and D channels	24 or 32 channel	Multimode	Y
TN2306	B and D channels	24 or 32 channel	Single-mode	Y

NOTE:
TN230x circuit packs are not interchangeable.

ATM Circuit Emulation Service

Under ATM Circuit Emulation Service (CES), you simulate ISDN-PRI circuits by assigning ports to *signaling groups*. Each signaling group represents a PRI circuit, and the ports in the group represent the D channel and B channels of that circuit. TN230x circuit packs support up to 248 ports per circuit pack.

Virtual D channels

Non-facility associated signaling is not supported under ATM-CES, so you must reserve one port in each signaling group for use as a D channel (channel 24 when emulating a T-1 ISDN facility, channel 16 when emulating an E-1 facility). The D channel can be any physical port from 9 to 32.

Virtual circuits

The TN230x can support a varied number of virtual circuits, depending on the switch and the administration of the circuit pack. Table 188, Circuit and channel capacities, for each DEFINITY model, on page 446 lists the possibilities for various DEFINITY ECS models.

Table 188: Circuit and channel capacities, for each DEFINITY model

Model	Ports	Emulated circuits (signaling groups)	Channels/ circuit	Virtual D channels	Virtual B channels
csi	248	1 to 8	24 (T1), 31 (E1)	1–8	6–240
si	248	1 to 8	24 (T1), 31 (E1)	1–8	6–240
r	248	1 to 8	24 (T1), 31 (E1)	1–8	6–240

Virtual trunk groups

You cannot bundle physical DS1 ISDN-PRI circuits and virtual ATM-CES circuits into the same trunk groups. Virtual circuits can only be assigned to all-virtual, all-ATM trunk groups. Table 189, ATM CES capacities by DEFINITY model, on page 446 lists the possible trunk-group capacities.

Table 189: ATM CES capacities by DEFINITY model

Model	Ports per trunk group (max)	Trunk groups per switch (max)	Trunks per switch (max)
csi	99	99	400
si	99	99	400
r	255	666	400

Table 190, Ports available for trunking, for each ISDN facility type, on page 447 shows the ATM CES capacities for both T1 and E1 circuits.

Table 190: Ports available for trunking, for each ISDN facility type

Type	Channels per signaling group (trunk)	Max. signaling groups (trunks) per circuit pack	Max. available ports	Reserved ports	Total ports
T1:	24	8	192	ports 1-8	256
E1:	31	8	248	ports 1-8	256

LEDs

The ATM circuit pack LEDs give you a visual indication of the condition of the TN230x circuit pack (Table 191, ATM-TRK LED interpretation, on page 447).

Table 191: ATM-TRK LED interpretation

LEDs	Condition	LED status
Red	Error (alarm logged)	On
Red and Green	Booting (LEDs being tested)	Blinking (on 200 ms, off 200 ms)
Green	Test/maintenance in progress	On
Amber	Fiber Loss of Signal (LOS), LOF, MS_RDI, MS_AIS, LCD, HP_RDI, HP_AIS, LOP, PSC	Blinking fast (100 ms on, 100 ms off)
Amber	Signal to ATM switch down	Blinking slowly (500 ms on, 500 ms off)
Amber	One or more CES signaling groups administered	On
Amber	CES signaling group not administered or not reporting to firmware	Off

ATM-TRK-related commands

Table 192, ATM CES troubleshooting commands, on page 448 lists some commands that can be useful in troubleshooting ATM errors and alarms.

Table 192: ATM CES troubleshooting commands

Command	Description
display circuit-packs *cabinet*	Shows the circuit packs in the cabinet, identifying ATM trunk as well as ATM-EI boards. "ATM Interface" boards have not been administered as CES or PNC.
display atm ports *UUCSSppp*	Shows the 256 ports on the ATM board with the corresponding signaling and trunk group.
list configuration atm	Lists the ATM boards, identifying equipment location, board code, type, and vintage.
list configuration trunks	Lists boards identifying assigned ports. While the ATM board is listed, the 256 ports are not.
busyout/release atm signaling-group	Busyout or release of an ATM signaling group within a trunk group.
status atm signaling-group	Show current status of an ATM signaling group.
status trunk-group	Shows status of the trunk group (ATM signaling groups are part of trunk groups).

Error Log Entries and Test to Clear Values

Table 193: ATM-TRK Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		**test board** *UUCSS*
1(a)		None	MIN	ON	
18(b)	0	**busyout board *UUCSS***	MIN	ON	**release board** *UUCSS*
23(c)	0	None	MIN	ON	
125(d)		None	MIN	ON	
257(e)	Any	Control Channel Loop test (#52)	MIN	ON	**test board** *UUCSS* **r 2**
513(f)	Any	ATM Cross talk test (#1298)	MIN	ON	**test board** *UUCSS* **l r 1**
769(g)	35	ATM Error Query test (#1259)	WRN	OFF	**test board** *UUCSS*
770(g)	25	ATM Error Query test (#1259)	WRN	OFF	**test board** *UUCSS*
771(h)	26	ATM Error Query test (#1259)	WRN	OFF	**test board** *UUCSS*

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Table 193: ATM-TRK Error Log entries *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1281(i)		ATM Board Error Query test (#1259)	WRN/ MIN	OFF	**test board** *UUCSS* **r 1**
1537(j)	12	None	WRN/ MIN	ON	
1538(k)	0	None	WRN/ MIN	ON	**reset board** *UUCSS*
1794(l)	13	None	MIN	ON	
2049(m)	15	None	WRN	OFF	**test board** *UUCSS*
2306(n)		None			
2561(o)		Packet interface test (#598)	MIN	ON	**test board** *UUCSS* **r 2**
2817(p)	1-24	ATM Board DSP test (#1293)	WRN/ MIN	ON	**test board** *UUCSS*
2818(p)	1-24		WRN/ MIN	ON	**test board** *UUCSS*
3330(q)	3		MIN	OFF	
3585(r)		ATM Board Error Query test (#1259)	WRN/ MIN	ON	**test board** *UUCSS* **l**
3841(s)	Any	None			
3842(t)	11	None			
3843 (u)		None			
3999(v)	Any	None			

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Notes:

a **Error Type 1:** the ATM-TRK circuit pack does not appear to be in its assigned slot.

1 Make sure that the ATM-TRK circuit pack is installed correctly seated in the slot administered for the ATM trunk.

b **Error Type 18:** the ATM circuit pack is busied out.

1 Run **release board *UUCSS***.

c **Error Type 23:** an ATM trunk is administered, but the corresponding ATM-TRK circuit pack does not appear to be physically installed.

1 Make sure the ATM-TRK circuit pack is installed and correctly seated in the slot.

d **Error Type 125:** an ATM trunk is administered but a non-ATM-TRK circuit pack is installed in the corresponding slot. You have two options:

- Replace the incorrect circuit pack with an ATM-TRK circuit pack.
- Or re-administer the slot for the circuit pack that is physically present, locate the slot where the ATM-TRK circuit pack is actually installed, and re-administer the ATM trunk.

e **Error Type 257:** Control Channel Loop test (#52) failed. The circuit pack is not properly connected with the control channel on the TDM bus.

1 Take the corrective action specified by Test #52.

f **Error Type 513:** ATM Crosstalk test (#1298) failed. The board is writing to or reading from a TDM time slot that is not allocated to the board, or the Digital Signal Processor (DSP) selected for this test has malfunctioned.

1 Run **test board *UUCSS***.

2 Take the corrective action specified for Test #1298.

g **Error Type 769, 770:** the ATM switch is requesting too many LAPD retransmissions (off-board ATM cell corruption errors).

Error Type	Aux Data	Description
769	35	Excessive LAPD retransmission requests
770	25	Uncorrectable ATM cell headers – threshold

1 Check the connections between the fiber cable, the ATM-TRK circuit pack, and the ATM switch.

2 See PKT-BUS (Packet Bus) on page 1406 for test and corrective procedures.

3 Determine what type of fiber is installed between the ATM-TRK circuit pack and the ATM switch.

If	Then
There is multimode fiber	Check the length of the fiber. If the cable is longer than 2 km, it may be causing errors.
There is single-mode fiber or the length of the multimode fiber is less than 2 km	The source of the errors can lie in the ATM facility, the ATM-TRK circuit pack, or the far-end circuit pack.

4 Perform ATM loopback tests on the near-end ATM-TRK circuit pack and on the far-end circuit pack or ATM switch.

If	Then
The ATM-TRK circuit pack fails the loopback test.	The problem is in the ATM-TRK circuit pack. Replace the circuit pack.
The far-end circuit pack or ATM switch fails the loopback test.	The problem is in the far-end circuit pack or ATM switch. Consult the circuit-pack or ATM switch documentation for advice.
The equipment at each end of the ATM span passes the loopback test	The problem is somewhere in the ATM span. Lack of bandwidth can be forcing an intermediate ATM switch to drop cells.

5 Check capacity and peak bandwidth consumption for the ATM span.

If	Then
The capacity of the span is inadequate, or bandwidth consumption is too high.	Reduce traffic on the system to ensure that it is using no more that its subscribed bandwidth.

h **Error Type 771:** the ATM switch is sending cells with unknown Virtual Path-Identifier (VPI) and Virtual Channel-Identifier (VCI) addresses.

1 Make sure that the ATM-TRK circuit-pack address is administered identically on the ATM switch and the S8700 Multi-Connect system.

i **Error Type 1281:** Board major signals error (loss of high-level signal). The far end has detected a major problem in transmissions originating from the ATM-TRK circuit pack. The possible Aux Data values for this software counter are listed in Table 194, Error type 1281 Aux Data and repair procedures, on page 451.

Table 194: Error type 1281 Aux Data and repair procedures

Aux Data	Alarm Description	Repair procedure
15	SYSCLOCK failed	The board is not locked to the TDM backplane clock signal. This is probably due to a Tone-Clock problem. **1** Check for TDM-BUS or TONE-BD errors in the Error Log. **2** If no other problems are present, reset the circuit pack (**reset board *UUCSS***)
16	Loss of Signal: LOS	The fiber is not connected properly to the ATM-TRK board or ATM switch (or to the multiplexer section [MUX] if present).It is possible that the board transceivers are not functioning properly. **1** Run **test board *UUCSS***. **2** If Test #1259 fails with Error Code 16, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. If it does the problem is off-board. **3** If the amber LED continues to flash, replace the circuit pack.
17	Loss of Frame: LOF	The fiber signal cannot obtain or maintain STM-1/OC-3 framing. **1** Try to more the fiber on the ATM switch side to a different port. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***).

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Table 194: Error type 1281 Aux Data and repair procedures*Continued*

Aux Data	Alarm Description	Repair procedure
18	Multiplexer Section Alarm Indication Signal: MS_AIS	There is a major problem on the far end (between multiplexer section [MUX] and the switch) that prohibits the circuit pack from sending a valid signal. **1** See if the ports at the MUX and/or the ATM switch are connected snugly. **2** Run **test board *UUCSS***. **3** If Test #1259 fails with Error Code 18, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. **4** If it does the problem is off-board. **5** If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
19	Multiplexer Section Remote Defect Indicator: MS_RDI	The far end is detecting a major problem with the signal that this board is transmitting. **1** Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface **2** Run **test board *UUCSS*** command. **3** If Test #1259 fails with Error Code 19, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. **4** If it does the problem is off-board. **5** If the amber LED continues to flash, replace the circuit pack; if the error persists, escalate the problem.
20	Loss of pointer: LOP	ATM framer chip is unable to access the payload part of the signal. **1** Reset the board (**reset board *UUCSS***). **2** If the error persists replace the board.
21	Path Signal Error (PSL) (STM1/SONET)	The incoming signal payload is not set up for transmission of ATM data. **1** Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface.

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Table 194: Error type 1281 Aux Data and repair procedures*Continued*

Aux Data	Alarm Description	Repair procedure
22	High-level Path Alarm Indication Signal: HP_AIS	The payload is invalid. **1** Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface. **2** Run **test board *UUCSS***. **3** If Test #1259 fails with Error Code 22, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. **4** If it does the problem is off-board. **5** If the amber LED continues to flash, replace the circuit pack.
23	High-level path Remote defect Indicator: HP_RDI	The far end is detecting a major problem with the signal that this board is transmitting. The transmitted payload is invalid. **1** Make sure the ATM switch port (or a MUX port, if present between ATM switch and the ATM-TRK board) is the same as the ATM-TRK circuit pack's cable interface. **2** Run **test board *UUCSS*** command; if Test #1259 fails with Error Code 23, connect a fiber back-to-back in a looped mode (one strand of fiber connecting the transmit transceiver to the receive transceiver of the board) and see if the amber LED flash goes away. **3** If it does the problem is off-board. **4** If the amber LED continues to flash, replace the circuit pack.

Table 194: Error type 1281 Aux Data and repair procedures*Continued*

Aux Data	Alarm Description	Repair procedure
24	Loss of cell delineation (LCD)	On board ATM framer chip is not able to frame cells based on the cell header. **1** Reset the board (**reset board *UUCSS***). **2** If the error persists, replace the board.
27	SIGCON_DOWN ATM switch high level signal.	The board cannot communicate with the ATM switch. **1** Busyout the board (**busyout board *UUCSS***). **2** Test the board (**test board long *UUCSS***). **3** If Test #1260 fails, replace the board. **4** If Test #1260 passes, make sure the ATM address on both the S8700 Multi-Connect and the ATM switch sides are the same for this board. **5** If the address is the same, change the port on the ATM switch side. **6** If the error is resolved, the problem is on the ATM switch port.

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j **Error Type 1537:** LANHO bus timeout. The circuit pack is transmitting too many bytes on the LAN bus for a single frame. This can be due to:

- an on-board fault.
- a faulty data received on one of the circuit pack's external ports.

If the error occurs three times in 10 minutes, the board is isolated from the packet bus, and the board is alarmed. To clear the alarm:

1 Restore this circuit pack to the packet bus with this command sequence:

a busyout board *UUCSS*

b reset board *UUCSS*

c test board *UUCSS* long

d release board *UUCSS*

2 If the problem persists and there are no PKT-BUS or port alarms, replace the circuit pack.

k **Error Type 1538:** The ATM-TRK circuit pack is hyperactive (sending an abnormal number of control messages to the processor). Use the following command sequence for this ATM-TRK circuit pack:

1 busyout board *UUCSS*

2 reset board *UUCSS*

3 test board *UUCSS* long

4 release board *UUCSS*

5 If this error persists, replace the circuit pack.

l Error Type 1794: LANHO transmit FIFO overflow. The circuit pack's transmit buffers have overflowed.

1 Run **test board *UUCSS* r 5**.

If	Then
Test #598 fails	Replace the circuit pack.

m **Error Type 2049:** ACL Link Failure (link is down). The ATM Control Link (ACL) has failed, communication has been interrupted between the server and the ATM-TRK circuit packs on the system, and signaling-group parameters are not communicated across the packet bus.

1 Check the 'PKT-BUS (Packet Bus) on page 1406 and 'SYS-LINK (System Links) on page 1782 MOs, and follow the repair procedures indicated.

2 Run **test board *UUCSS*** against the ATM-TRK circuit pack.

If	Then
Test 598 fails.	Follow the repair procedures suggested for that test.

n **Error Type 2306:** too many parity errors in data received from the LAN/packet bus.

1 Run **test board UUCSS**.

If	Then
Test 598 fails.	Follow the repair procedures suggested for that test.
Test 598 passes	See PKT-BUS (Packet Bus) and perform the specified repair.
There are no errors against the packet bus MO	This can be a transient condition. Do nothing now, but escalate if the error occurs repeatedly.

o **Error Type 2561:** Packet Interface Loop Around test (#598) failure. The ATM-TRK circuit pack has failed, the packet bus has a minor alarm active, or the packet bus is out of service.

1 Run **test board UUCSS**.

If	Then
Test 598 fails	Follow the repair procedures suggested for that test.
Test 598 passes	See PKT-BUS (Packet Bus) and perform the specified repair.
There are no errors against the packet bus MO	This can be a transient condition. Do nothing now, but escalate if the error occurs repeatedly.

p **Error Type 2817, 2818:** DSP failure detected along the circuit path.

1 Run **test board UUCSS**.

2 Follow the repair procedures suggested for Test #1293.

Error Type	Description
2818	One or more DSPs failed. The Aux Data field contains the ID number of DSP that failed
2817	DSP test failure. The Aux Data field contains the following information about the failed DSPs: X is the number of talker DSPs Y is the number of listener DSPs Z is the number of echo-cancelling DSPs

q **Error Type 3330:** LANHO critical error. The circuit pack reports that the on-board LANHO chip is insane (possibly due to a problem in packet-bus arbitration, in the transmission line frame, or in the circuit pack itself). The circuit pack cannot talk to the packet bus.

1 Check for PKT-BUS alarms.

If	Then
There is a packet-bus alarm	There is probably a packet-bus problem, particularly if other circuit packs on the packet bus report the same error. See PKT-BUS (Packet Bus) and Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in Maintenance Procedures (555-245-103) for repair procedures.
There are no packet-bus alarms	Run the following command sequence: **1** busyout board *UUCSS* **2** reset board *UUCSS* **3** test board *UUCSS* long **4** release board *UUCSS*
The problem persists	Replace the ATM-TRK circuit pack.

r **Error Type 3585:** Major board alarm; failure of critical components involved in the operation of the circuit pack. The circuit pack has failed, and the switch can no longer recognize it.

Aux Data	Description
1	ATM framer chip failure
2	NCE failed
4	TDM PLD failed
5	Every DSP on the circuit pack has failed.
6	RNP (Receive Network Processor) failed
7	TNP (Transmit Network Processor) failed
8	MEMORY read/write failure
9	DUART failure

1 Run **test board UUCSS long**.

If	Then
Test #1259 fails with Error Code XXYY and XX is an AUX value in the preceding table	Replace the ATM-TRK circuit pack.
The system does not recognize the circuit pack	Replace the ATM-TRK circuit pack.

s **Error Type 3841:** the ATM-TRK circuit pack received an unrecognized message from the switch and responded with an inconsistent down-link error message.

1 Do nothing. This error does not affect service.

t **Error Type 3842:** LANHO Receive FIFO Overflow error; the packet bus is delivering data to the ATM-TRK circuit pack faster than the circuit pack can distribute it to the endpoint.

1 Do nothing. The circuit pack can recover by itself.

u **Error Type 3843:** The firmware on the circuit pack is reporting a resource that is to low. This error does not affect the service and no action is required.

- **Error Type 3999:** circuit pack sent a large number of control channel messages to the switch within a short period of time.

If	Then
Error Type 1538 is also present	Circuit pack is taken out of service.
Error Type 1538 is absent	Circuit pack is not taken out of service, but has generated 50% of the messages necessary to be considered hyperactive. • This can be normal during heavy traffic. • If the error is logged during light traffic, it can indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and error codes

Always investigate problems in the order presented. When you clear one of the error codes associated with a given test, you clear errors generated by other tests in the testing sequence. If you clear errors out of order, you can lose important information.

Table 195: System Technician-Demanded Tests: ATM-TRK

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
ATM Board Time Of Day Update (#1261)		X		ND
Connection Audit test (#50)		X		ND
Control Channel Loop test (#52)		X		ND
Packet Interface Loop Around test (#598)	X	X		ND
ATM DSP test (#1293)	X	X		ND
ATM Board Framer Looparound test (#1260)		X		D
ATM Board Error Query test (#1259)	X	X		ND
ATM Cross Talk test (#1298)		X		ND
ATM Board Reset (#1256)			X	D

1 D = Destructive, ND = Nondestructive

Connection Audit Test (#50)

Nondestructive (in a sane switch environment).

The Connection Audit test updates TDM time slots. It sends network-update Control Channel Message Set (CCMS) messages that tell the ATM-TRK circuit pack to listen to, talk to, or disconnect particular time slots.

The test passes if software successfully sends the downlink network-update messages. It aborts otherwise.

CAUTION:
Though normally nondestructive, this test could unintentionally tear down an active call if the connection-manager software's tables are corrupt.

Table 196: Test #50 Connection Audit Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	System resources required for this test are not available. Retry the command up to 5 times at 1-minute intervals.
1019	ABORT	The test aborted because a test was already running on the port. Retry the command up to 5 times at 1-minute intervals.
	FAIL	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
	PASS	The circuit pack has been updated with its translation.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check the board translations. **2** If the ATM-TRK circuit pack is not administered, run **add atm trunk *UUCSS***. **3** If the ATM-TRK circuit pack is administered correctly, check the error log. **4** If ATM-TRK circuit pack is hyperactive, shut down, and reseat the circuit pack to force re-initialization. **5** If the ATM-TRK circuit pack is correctly inserted, run **busyout board**. **6** Run **reset board**. **7** Run **release board**. **8** Run **test board long** to re-establish the linkage between the internal ID and the port.

Control Channel Loop Test (#52)

The nondestructive Control Channel Loop test is part of the maintenance subsystem's Common Port Board Testing feature. The Common Port Board test sends board vintage queries to a port circuit pack and checks the responses. CCMS downlink notifications tell the circuit pack which TDM Bus (A or B) carries the control channel and which carries the touch tones.

The test passes if the port circuit pack responds. The test aborts if the circuit pack does not respond. The test fails otherwise.

Table 197: Control Channel Test #52

Error Code	Test Result	Description / Recommendation
2000	ABORT	Test request timed out.
2100	ABORT	Could not allocate needed system resources.
2500	ABORT	Internal system error **1** Retry the command up to 3 times at 1-minute intervals.
	FAIL	The ATM circuit pack responded incorrectly. **1** Retry the command up to 3 times at 1-minute intervals. **2** If the test continues to fail, reset the ATM-TRK circuit pack (**reset board *UUCSS***). **3** If test continues to fail, replace the circuit pack or transceiver.
	PASS	The ATM-TRK circuit pack is communicating correctly with the software.
0	NO BOARD	Circuit pack not detected. **1** Check the error log for Error 125 (wrong board) or Error 131 (no board), and correct any errors found. **2** Make sure that the ATM-TRK circuit pack is properly translated and inserted. **3** Check for Error 1538 (hyperactivity). If hyperactive, run **reset board *UUCSS***. **4** Run the test again. If it fails, replace the ATM-TRK circuit pack, and retest.

Packet Interface Loop Around Test (#598)

This nondestructive test checks the ATM-TRK circuit pack's packet-bus interface. The LANHO chip sends data through the bus and back to itself. If the data received is consistent with the data sent, the test passes. The test does not run if the specified PN's packet bus has a minor alarm or is out of service.

Table 198: Packet Interface Loop Around Test (#598)

Error Code	Test Result	Description / Recommendation
S8100: 1144	ABORT	The packet bus in the PPN has a major alarm against it. **1** Run **display alarms** and **display errors**. **2** Perform the PKT-BUS repair procedures associated with the alarms. **3** Retry the command.
2000	ABORT	Test request timed out. **1** Retry the command up to 3 times at 1-minute intervals. **2** If the test fails repeatedly, run **reset board *UUCSS***. **3** If the test continues to fail, replace the ATM-TRK circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate needed system resources. **1** Retry the command up to 5 times at 1-minute intervals.
ANY	FAIL	Data packet not received correctly by the ATM Interface circuit pack. **1** Retry the command up to 5 times at 1-minute intervals. **2** If the test continues to fail, replace the ATM-TRK circuit pack.
	PASS	The Packet Interface test passed.

ATM Board Reset (#1256)

This test is **destructive**.

This test checks the sanity of the angel processor using the Sanity and Control Interface (SAKI) test (Common Port Board test, #53). It resets the circuit pack if the SAKI test fails and runs the test again.The ATM Board Reset test passes if SAKI can successfully reset and retest the board.

Before running the SAKI test, you must:

- Move synchronization off the ATM-TRK circuit pack
- Busyout the ATM-TRK circuit pack

The test aborts if the ATM-TRK circuit pack is supplying synchronization.

Table 199: ATM Board Reset (#1256)

Error Code	Test Result	Description / Recommendation
1005	ABORT	Wrong circuit pack configuration to run this test. The ATM CES Trunk Interface circuit pack provides timing for the system and cannot be reset without major system disruptions. **1** Set synchronization to another ATM CES trunk circuit pack or to the Tone-Clock circuit pack and test again.
1015	ABORT	Test cannot be run because the ATM-TRK circuit pack has not been busied out. **1** Busyout out the circuit pack (**busyout board *UUCSS***). **2** Repeat the test (**test board *UUCSS* long**).
None	ABORT	Could not allocate the required system resources **1** Retry the command up to 5 times at 1-minute intervals. **2** If the test continues to abort escalate the problem.
2000	ABORT	Sanity test timed out. **1** Wait 5 minutes. Then see if ATM-TRK circuit pack is visible to the system by running **list configuration all**. **2** If the ATM-TRK circuit pack is visible (**list configuration all**), run the test again, and escalate if the problem recurs. **3** If the ATM-TRK circuit pack is not visible to the system (**list configuration all**), re-seat the ATM-TRK circuit pack, and retest. **4** If the ATM-TRK circuit pack is still not recognized by the system, replace the board.
2100	ABORT	Could not allocate required system resources **1** Retry the command up to 5 times at 1-minute intervals.
2500	ABORT	Internal system error **1** Try to reset the circuit pack (**reset board *UUCSS***).
1	FAIL	The circuit pack failed to reset
2	FAIL	The circuit pack failed to restart. **1** Retry command. **2** If the problem persists, replace the ATM-TRK circuit pack.

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Table 199: ATM Board Reset (#1256)

Error Code	Test Result	Description / Recommendation
	PASS	The ATM-TRK circuit pack is successfully reset.
0	NO BOARD	No board detected. **1** Check the error log for Error 125 (wrong board) or Error 131 (no board), and perform the appropriate repair, if needed. **2** Ensure that the board is properly translated and inserted. **3** Check for Error 1538 (hyperactivity). If hyperactive, run **reset board *UUCSS***. **4** Run the test again. If it fails, replace the ATM-TRK circuit pack, and retest.

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ATM Board Error Query Test (#1259)

This **non**destructive ATM Error Query test retrieves the most severe, active, on- and off-board problem from the ATM-TRK circuit pack's firmware and increments error counts in the Error Log.

The test passes if there are no errors and fails otherwise. A passing test clears the software counters; a failure increments the counter associated with the problem that caused the failure and clears the others.

Table 200: ATM Board Error Query Test (#1259)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Test request timed out.
2031	ABORT	SCD failure. Unable to sent down-link message.
2100	ABORT	Could not allocate needed system resources.
2500	ABORT	Internal system error **1** Retry the command up to 3 times at 1-minute intervals.
XXYY	FAIL	On-board error XX (Table 201, Aux Data XX for ATM Board Error Query Test (#1259), on page 464) and/or off-board error YY (Table 202, Aux Data YY for ATM Board Error Query Test (#1259), on page 465). **1** Examine the error logs and repair any errors found.

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Table 200: ATM Board Error Query Test (#1259)

Error Code	Test Result	Description / Recommendation
	PASS	The ATM circuit pack has passed this test. No service effecting errors/alarms have been detected on board.
0	NO BOARD	ATM-TRK circuit pack not found **1** Check the error log, and correct Error 125 (wrong board) or Error 131 (no board), if found. **2** Make sure that the board is properly translated and inserted. **3** Check for hyperactivity (Error 1538). Run **reset board *UUCSS*** if hyperactive. **4** Run the test again. If it fails, replace the board, and retest.

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Aux Data XX

Table 201: Aux Data XX for ATM Board Error Query Test (#1259)

If XX=	Then
1	ATM framer chip failed
2	NCE chip failed
3	LANHO critical error
4	TDM Programmable Logic Device failed
5	Every on-board DSP failed
6	Receive Network Processor failed
7	Transmit Network Processor failed
8	Memory read failed
9	Dual UART chip failed
10	LANHO receive parity error
11	LANHO FIFO overflow error
12	LAN bus time out
13	LANHO Xmit FIFO overflow error
14	One or more on-board DSPs failed

Aux Data YY

Table 202: Aux Data YY for ATM Board Error Query Test (#1259)

If YY=	Then
15	Back plane clock failed
16	Loss of signal
17	Loss of frame
18	MS alarm indication signal error
19	MS remote defect indicator error
20	Loss of pointer
21	Path signal level mismatch
22	High-level path alarm indication signal
23	High-level path remote defect indicator
24	Loss of cell delineation
25	Uncorrectable headers sent by the ATM switch
26	Too many cells with invalid VPI/VCI combination
27	The signaling link between the board and the ATM switch is down.
34	Excessive AAL-5 retransmission requests - per VC
35	Excessive LAPD retransmission requests - per VC
37	ATM CLP (cell loss priority) bit – see MO ATM-NTWK (ATM Network Error)
38	ATM congestion indicator – see MO ATM-NTWK (ATM Network Error)
39	ATM cell underrun – see MO ATM-NTWK (ATM Network Error)
40	ATM cell overrun – see MO ATM-NTWK (ATM Network Error)
41	Lost ATM cells – see MO ATM-NTWK (ATM Network Error)

ATM Board Framer Loop-Around Test (#1260)

This test is **destructive**.

This test verifies the board's circuit (Time Division Multiplexing) and packet paths using an on-board, dummy virtual circuit. Before running the test, you must:

- busyout the ATM-TRK circuit pack (**busyout board *UUCSS***) and
- switch synchronization (**change synchronization**) from the ATM-TRK circuit pack

If the ATM-TRK circuit pack is supplying synchronization, the test aborts.

The test sends a digital counter from one of the Tone Generators via one of the TDM bus time slots. The ATM framer interface converts this digital counter to ATM cells and loops them back internally. The ATM-TRK circuit pack converts the cells back to a digital counter and sends it to the tone receiver for

verification. If the circuit pack passes the circuit check, the software checks the packet path by sending a packet from the packet-interface circuit pack to the ATM-TRK circuit pack via the ATM protocol stack.

Table 203: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
1002	ABORT	Time slots could not be allocated. Traffic could be heavy or time slots could be out-of-service. **1** Run **display errors**, and perform repairs associated with TDM-BUS errors. **2** Retry the command up to 3 times at 1-minute intervals.
1003	ABORT	Tone receiver could not be allocated. **1** Run **display errors**, and perform the repairs associated with TTR-LEV and TONE-PT errors. The test cannot run unless there is at least one Tone Detector available in the PN that holds the ATM-TRK circuit pack. **2** Retry the command up to 3 times at 1-minute intervals.
1015	ABORT	ATM-TRK circuit pack not busied out **1** Busyout the ATM circuit pack. **2** Rerun the command.
1033	ABORT	ATM-TRK circuit pack not found **1** See if the switch can see the circuit pack. Run **status trunk group**. **2** Retry the command.
1139	ABORT	Major alarm on the PN's (**S8100**: EPN) packet bus **1** Run **display alarms**, and perform the repairs associated with PKT-BUS errors. **2** Run **display errors**, and perform the repairs associated with PKT-BUS errors. **3** Retry the command.
1141	ABORT	Packet-interface circuit pack out of service **1** See PKT-INT (Packet Interface).
S8100: 1144	ABORT	Major alarm on the PPN packet bus **1** Run **display alarms**, and perform the repairs associated with PKT-BUS. **2** Run **display errors**, and perform the repairs associated with PKT-BUS. **3** Retry the command.
1394	ABORT	ATM-TRK circuit pack out of service **1** Run ATM Board Reset Test #1256.
2000	ABORT	Request timed out. **1** Retry the command up to 3 times at 1-minute intervals.

Table 203: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
2060	ABORT	Packet-bus link has failed. **1** Retry the command up to 3 times at 1-minute intervals. **2** If the test continues to abort, run **display errors**, and perform the repairs associated with PKT-INT errors.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command up to 3 times at 1-minute intervals.
1	FAIL	Test tone not detected over the loop around; packet-path test aborted. **1** Test the active Tone-Clock in the PN, and verify that a tone is reaching the ATM-TRK circuit pack. If not, correct the condition. **2** Run **test board *UUCSS* long**. **3** If the test continues to fail, replace the ATM-TRK circuit pack or transceiver. **4** Rerun **test board UUCSS long.**
2	FAIL	TN1655 Packet Interface circuit pack could not detect the correct data packet. **1** Test the TN1655 Packet Interface circuit pack to verify that it is functioning properly. If not, correct the condition. **2** Run **display errors**, and perform the repairs associated with DS1C-BD errors, if applicable. **3** Run **display alarms**, and perform the repairs associated with DS1C-BD alarms, if applicable. **4** Run **test board *UUCSS* long**. **5** If this test continues to fail, replace the ATM-TRK circuit pack. **6** Run **test board *UUCSS* long**.
3	FAIL	Distorted tone returned **1** Test the active Tone-Clock in the PN, and verify that a tone is reaching the ATM-TRK circuit pack. If not, correct the condition. **2** Run **test board *UUCSS* long**. **3** If the test continues to fail, replace the ATM-TRK circuit pack. **4** Run **test board *UUCSS* long**.
4	FAIL	Unable to create TDM-path loop. **1** Retry the command up to 3 times at 1-minute intervals. **2** If this test continues to fail, replace the ATM-TRK circuit pack. **3** Run **test board *UUCSS* long**.

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Table 203: ATM Board Framer Loop-Around Test (#1260)

Error Code	Test Result	Description / Recommendation
5	FAIL	Unable to create packet-path loop. **1** Retry the command up to 3 times at 1-minute intervals. **2** If this test continues to fail, replace the ATM-TRK circuit pack. **3** Rerun **test board *UUCSS* long**.
6	FAIL	A previously established loop around was not released. **1** Run **reset board *UUCSS***. **2** Retry the command up to 3 times at 1-minute intervals. **3** If this test continues to fail, replace the ATM-TRK circuit pack. **4** Rerun **test board *UUCSS* long**.
	PASS	The non-optical parts of the ATM-TRK circuit pack are functioning properly.
0	NO BOARD	ATM-TRK circuit pack not found **1** Check the error log for Error 125 (wrong board) or Error 131 (no board), and correct as necessary. **2** Check that the board is properly translated and inserted. **3** Check for Error 1538 (hyperactivity), and run **reset board *UUCSS*** if necessary. **4** Rerun **test board *UUCSS* long**. **5** If the test fails, replace the board, and rerun **test board *UUCSS* long**.

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ATM Board Time Of Day Update (#1261)

The nondestructive ATM-TOD-UPD test updates the system time used by the ATM-TRK circuit pack for SDH/SONET performance monitoring and synchronizes the ATM-TRK circuit pack with the S8700 Multi-Connect system's clock. This test is run during initialization, scheduled maintenance, and craft long test.

Table 204: ATM Board Time Of Day Update (#1261)

Error Code	Test Result	Description / Recommendation
2031	FAIL	The attempt to send the message to the ATM-TRK circuit pack was not successful.
2500	FAIL	Internal system error. Did not send the time-of-day information to the board. **1** Retry the command up to 3 times at 1-minute intervals. **2** If the test aborts with the same error code, escalate the problem.

1 of 2

Table 204: ATM Board Time Of Day Update (#1261)

Error Code	Test Result	Description / Recommendation
	PASS	The ATM-TRK circuit pack is successfully updated with system time. **1** If **status port-network** still indicates that this link is down, it is possible that one or both of the ATM-TRK circuit packs have been busied out. **2** If the link still does not come up, reset one or both ATM-TRK circuit packs on the link.
0	NO BOARD	No board detected. **1** Check the error log for wrong board (Error 125) or no board (Error 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **1** Run the test again. If it fails, the board could be bad. Replace the board and retest.

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ATM Board DSP Test (#1293)

This test is **non**destructive.

There are three kinds of digital signal processors (DSPs): talkers, listeners, and echo cancelers.Talkers put data on the TDM bus, listeners take data off the TDM bus, and echo cancelers filter out echoes of the main transmission. Firmware allocates DSPs in sets of three (one of each type), up to a maximum of 8 sets. This has three parts, one for each type of DSP. If the test fails for every DSP, a MAJOR alarm is raised. If the test fails for one or more DSPs, a MINOR alarm is raised. If a DSP is busy, the test passes for that DSP. The test aborts if system resources are not available. Each part of the test returns the number of DSPs that passed or failed. This test run during initialization, error analysis testing, periodic, scheduled, and craft short and long testing.

Table 205: ATM Board DSP Test (#1293)

Error Code	Test Result	Description / Recommendation
1002	ABORT	Could not allocate time slots. Traffic could be heavy or time slots could be out-of-service. **1** Run **display errors**, and follow associated repair procedures for TDM-BUS. **2** Retry the command up to 3 times at 1-minute intervals.

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Table 205: ATM Board DSP Test (#1293)

Error Code	Test Result	Description / Recommendation
1003	ABORT	Could not allocate a Tone Detector. Too few Tone Detectors present or Tone Detectors out-of-service. **1** Run **display errors**, and follow the repair procedures associated with any TTR-LEV (TTR Level) errors that appear. **2** Verify that there is at least one Tone Detector in the PN that holds the ATM-TRK circuit pack. **3** Resolve any TONE-PT (Tone Generator) errors listed in the Error Log. **4** Retry the command up to 3 times at 1-minute intervals.
1962	ABORT	Every DSPs is busy. This is a very unlikely event. **1** Retry the command up to 3 times at 1-minute intervals.
2000	ABORT	Test timed out. **1** If the ATM-TRK circuit pack is in standby, reset the board and run the test again after the ATM-TRK circuit pack is inserted. **2** Examine the Error Log for Error 1218 (bad DSP). **3** Run the test again.
2100	ABORT	Could not allocate required system resources.
2302	ABORT	Inconsistent uplink message from the ATM-TRK circuit pack.
2500	ABORT	Internal system error **1** Retry the command up to 5 times at 1-minute intervals.
2752	ABORT	Circuit pack not a TN2305A/2306A.
XYZ	FAIL	There is at least one bad DSP on the board. The ***X*** value indicates the number of bad talker DSPs, ***Y*** indicates the number of bad listener DSPs and ***Z*** indicates the number of bad echo canceler DSPs. **1** Test the Active Tone-Clock in the PN that contains the ATM-TRK circuit pack for dial-tone. Repair as needed. **2** Repeat the short test on the ATM-TRK circuit pack. **3** If the test continues to fail, check for service-affecting MINOR alarms. If a MINOR alarm is raised for Error Type 2817 or 1818, replace the circuit pack. **4** If a WARNING alarm is raised, this is a non-service-affecting error, and the circuit pack can still process calls.
XY8	PASS	The test passed for some or all DSPs. XY8 indicates the number of talker, listener, and echo-canceler DSPs for which the test passed (the rest of the DSPs were skipped). The ***X*** value indicates the number of good talker DSPs, ***Y*** indicates the number of good listener DSPs, and ***Z*** indicates the number of good echo canceler DSPs.

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Table 205: ATM Board DSP Test (#1293)

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board detected. **1** Check the Error Log for wrong board Error 125 (wrong board) or Error 131 (no board). Replace or insert the circuit pack if necessary. **2** Check that the board is properly translated and inserted. **3** If Error 1538 (hyperactivity) is listed in the Error Log, and run **reset board *UUCSS***. **4** Run the test again, and, if it fails, replace the ATM-TRK circuit pack. **5** Retest.

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ATM Cross Talk Test (#1298)

This nondestructive ATM Cross Talk test makes sure that TDM time slots are correctly allocated to connections. It is useful for diagnosing one-way or noisy connections. The test fails if the TDM programmable logic and/or the interface to the DSP is not operating properly. The test can take more than 10 minutes.

Table 206: ATM Crosstalk Test (#1298)

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate required system resources. **1** Retry the command up to 5 times at 1-minute intervals.
1002	ABORT	Could not allocate time slots. Traffic could be heavy or time slots could be out-of-service. **1** Identify and correct TDM-bus errors (if any) using the procedures in the TDM-BUS (TDM Bus) MO. **2** Repeat the test up to 5 times at 1-minute intervals.
1003	ABORT	Could not allocate a tone receiver. Too few Tone Detectors installed or Tone Detectors out-of-service. **1** Identify and correct any TTR-LEV (TTR Level) errors listed in the Error Log. **2** Resolve any TONE-PT (Tone Generator) errors listed in the Error Log. **3** Retry the test up to 5 times at 1-minute intervals a maximum.
1962	ABORT	Every TALKER DSP is busy.
2000	ABORT	Test timed out.
2100	ABORT	Could not allocate required system resources **1** Retry the command 5 times at 1-minute intervals.

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Table 206: ATM Crosstalk Test (#1298)

Error Code	Test Result	Description / Recommendation
2302	ABORT	Inconsistent uplink message from the ATM-TRK circuit pack. **1** Retry the command up to 3 times at 1-minute intervals.
2752	ABORT	The circuit pack in this location is not a TN2305A/2306A.
1–8, None	FAIL	ATM-TRK circuit pack writing on unauthorized TDM time slots. The error code indicates the number of TALKER DSPs that are at fault. These DSPs cannot be used again until this test of the ATM DSP test (#1293) tells the circuit pack to use them again. **1** Retry the command up to 3 times at 1-minute intervals. **2** If the failure persists, replace the circuit pack.
1-8	PASS	ATM-TRK circuit pack not talking to un-authorized time slots on the TDM bus. The error code indicates the number of TALKER DSPs tested.

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ATM-WSP (ATM WAN Spare Processor)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ATM-WSP	MAJOR	**status atm wsp**	ATM WAN Spare Processor
ATM-WSP	MINOR	**status atm wsp**	ATM WAN Spare Processor
ATM-WSP	WARNING	**display atm wsp (1-15)**	ATM WAN Spare Processor

S8700 Multi-Connect systems with multiple PNs connected via ATM PNC have the option of installing up to 15 ATM WAN Spare Processor (WSP) units. Each WSP has the ability to function as the S8700 Multi-Connect server, if the main server is not functional or is not connected to one or more of the other PNs.

ATM WSP is available in S8700 Multi-Connect standard loads. A WSP is capable of running an entire S8700 Multi-Connect system (just as the main server can), or whatever PNs with which it can establish links while the ATM network is impaired. WSPs continually monitor a path to the main server to determine whether it is on-line. In the event of a main server failure, an automatic switch-over to WSP control is neither instantaneous nor call-preserving. Likewise, restoring the system to normal operation (under control of the main server) requires manual intervention, and is neither instantaneous nor call preserving.

Each WSP attempts to establish connections (links) to every other WSP and to the main server. These links are re-established once a minute. If a link cannot be re-established, its status is flagged as "down."

A WSP or main server is considered "down" if:

1 For standard reliability, links cannot be established on the A-PNC.

1 For a duplex- or high-reliability system and for standard reliability on the other WSPs, links cannot be established:

— to both A-PNCs of the main server

— on the A-PNC between other WSPs

2 For a critical-reliability system, links cannot be established on both the A- and B-PNCs.

A WSP becomes active (initiates a fail-over) when every link to a higher-priority WSP and the main server has been in a "down" state for an administered amount of time (as specified in the WSP Activation Timer field of the System-Parameters Maintenance screen).

When a WSP becomes active, a major alarm is raised against this MO (ATM-WSP). If it is later determined that the WSP should not be active, or the system is rebooted at a COLD-2 or more severe level, the WSP is returned to a standby state and the alarm retired. This alarm is never activated for the main server.

Operations of the ATM WAN Spare Processors

The WSP has the following operational features:

- The WSP feature is activated/deactivated via license file. You can verify that ATM WSP is enabled by checking the value of the ATM WAN Spare Processor field on the system-parameters customer-options screen.
- Fail-over occurs when the connections with the main server and every higher-priority WSP is lost (for an administrable period of time between 5 and 99 minutes; default = 5 minutes). When the administered threshold is exceeded, the highest-priority standby WSP becomes active. Once the standby WSP becomes active, it takes over control of one or more PNs. Restoration to the normal configuration must be manual.
- A WSP in the standby mode is not intended to be a DCS node. Although DCS could potentially play a role in an effective back-up or re-route strategy, no provision has been made to support DCS connections between parts of a failed switch. A WSP in the active mode can have the DCS functionality of the server.
- The main server makes no attempt to do maintenance on the WSPs.
- A WSP can perform maintenance on itself, and monitor WAN connectivity.
- A WSP is not recognized by the system's hardware or software as a PN when not active, and functions in place of the main server when active. Up to seven WSPs can reside in an ATM PNC configuration. The number of PNs in an S8700 Multi-Connect configuration is not limited by the number of WSPs used (i.e., the number of WSPs used is not subtracted from the total number of PNs to determine the number of PNs that can the system can support).
- Every WSP could potentially take over the entire S8700 Multi-Connect system.
- Links are established between the main server and each WSP, and from every WSP to every other WSP. These links are monitored by the WSPs, as well as by the main server, so that each processor is able to observe and report status.
- Each WSP is assigned a unique priority. WSPs become active if they cannot establish communications both with the main server and with a higher-priority WSP.
- An active WSP attempts to establish EAL connectivity to the PNs.
- Contention for support of PNs is addressed by prioritization, and also by the fact that the PNs accept an EAL connection to only the main server or one WSP at a time.

NOTE:
Each WSP reports its alarms to INADS as an individual system processor. The INADS database correlates WSPs together as part of a larger network.

Error Log Entries and Test to Clear Values

Table 207: ATM-WSP Error Log Entries

Error Type	Aux Data	Associated Test[1]	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		
18 (a)		MO busied out			**release atm wsp**
257 (b)		Active WSP (#1401)	MAJOR	OFF	**reset system 2**

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Table 207: ATM-WSP Error Log Entries

Error Type	Aux Data	Associated Test[1]	Alarm Level	On/Off Board	Test to Clear Value
513 (c)		WSP Link Status (#1400)	MINOR	OFF	
769 (d)	WSP #	WSP Priority Error	MINOR	OFF	
1025 (e)		WSP Error	WARNING	OFF	

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1 There are **no** system technician-demanded Tests associated with this MO. The tests listed in this column are tests run by system software.

Notes:

a **Error Type 18** — indicates that the ATM WSP has been busied out with the **busyout atm wsp** command. To resolve this error, check for any other errors that would require that the WSP be made maintenance busy. Clear every related alarm. After every related alarm is clear, or if there are no other alarms, release the ATM circuit pack using the **release atm wsp** command.

b **Error Type: 257** — indicates that the WSP has become active. When a WSP takes over, the error becomes active, and causes an alarm condition. This error is not applicable for the main server. Use the following procedures to return the system to normal operation:

1. Run **status atm wsp** on the active WSP to verify that the main server or a higher-priority WSP that you want to be in control is "up.**"**
2. If the main server or the higher-priority WSP is "up," then run **reset system 2.** The active WSP should relinquish control.
3. Wait a few minutes, and run **list sys-link** on the main server or higher-priority WSP to verify that the EAL and ACL system links are "up."

c **Error Type: 513** — indicates a down ATM WSP link status from this WSP to the main server or a higher-priority WSP. If any of the links are considered down, this alarm is logged. When every link probed by this WSP is "up," the alarm should be cleared.

Remember that more than one link can be down. To get a system-wide view of the status of the network run **status atm wsp**.

Aux Data Values are in the form of XYY where

- X is the PNC: 0 = A-PNC, 1 = B-PNC
- YY is the WSP number

Examples:

- An Aux Data of 15 indicates that the B-PNC link to WSP 5 is down.
- An Aux Data of 3 indicates that the A-PNC link to WSP 3 is down.

d **Error Type: 769** — indicates that there are inconsistent translations with regard to WSP's priority. Each WSP keeps a list of every other WSP's priority levels. Inconsistent priorities can exist that result in a WSP receiving an unexpected probe. This causes an alarm to be raised.

Follow the procedures listed below to correct any inconsistency in WSP priorities:

1. Obtain a list of WSP priorities from the system administrator.
2. Use the **display error** command to find the WSP number with the incorrect priority (the Aux Data of the error).

3 Use the **status atm wsp** command to determine whether any administered priorities are incorrect. Pay close attention to WSP X and the local WSP.

4 If any are incorrect, use the **change atm wsp *n*** command to administer the correct priority, where **n** is the appropriate WSP number. If the priorities for WSP X and the local WSP are both correct, then there is an error in priority administered on WSP X.

5 On WSP X, use the **status atm wsp** command to determine whether the priority of WSP X, the local WSP, and the priority of the WSP with the alarm are correct. At least one should be incorrect.

6 Use the **change atm wsp *n*** command to administer the correct WSP priority, where **n** is the appropriate WSP number.

e **Error Type: 1025** — indicates that there is a WSP error. The Aux Data determine the WSP number and error code.

Aux Data Values are in the form of XXYY where

- XX is the WSP number that probed this WSP
- YY is the error code (Table 208, Error type 1025 - Aux Data error codes for YY, on page 476)

Table 208: Error type 1025 - Aux Data error codes for YY

YY	Meaning
1	The probing WSP (XX value in Aux Data) contains an ATM address in its message that does not match the translation for that ATM address on this WSP.

Example: This is WSP 1. An Aux Data of 201 indicates that WSP 2 probed this WSP, and it has a different address in the probe message than WSP 1 has for WSP 2.

1 On WSP X, use **display atm wsp *X*** to determine its address.

2 On this WSP, use **change atm wsp *X*** to change the address of WSP X, if they do not match.

3 If the addresses do match, then the ATM switch has a different address administered for WSP X, even though each WSP is consistent.

System Technician-Demanded Tests: Descriptions and Error Codes

There are **no** system technician-demanded tests associated with this MO.

ATT-ADJ (AvayaAdjunct), ATTE-AJ (Ethernet Avaya Adjunct)

S8700 / S8500 / S8100

See BRI-SET, BRI-DAT, Various Adjuncts on page 520.

AUDIX-BD (AUDIX Circuit Pack)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
AUDIX-BD	MINOR	**test board *location* sh**	AUDIX circuit pack
AUDIX-BD	WARNING	**test board *location* sh**	AUDIX circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

The AUDIX-BD MO represents a TN566/TN2169 EMBEDDED AUDIX circuit pack combination. For circuit-pack-level problems, see 'XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

EMBEDDED AUDIX consists of a combination of two circuit packs that occupy five slots on a port carrier. The tests described in this manual apply only to switch-side maintenance that tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy that is described in *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110*

AUDIX-PT (AUDIX Port)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
AUDIX-PT	MINOR	**test port *location* l**	AUDIX port
AUDIX-PT	WARNING	**test port *location* sh**	AUDIX port

1 For information on specifying a location, see Command Syntax on page 179.

The AUDIX-PT MO represents a port on a TN566/TN2169 EMBEDDED AUDIX circuit pack operating in digital-port (DP) mode. For circuit-pack-level problems (AUDIX-BD), see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

The maintenance strategy for ports on the TN566 operating in control-link mode is described in ADX16A-PT.

AUX-BD (Auxiliary Trunk Circuit Pack)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
AUX-BD	MINOR	**test board *location* sh**	Auxiliary Trunk circuit pack
AUX-BD	WARNING	**test board *location* sh**	Auxiliary Trunk circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 maintenance information for circuit pack-level errors. See also AUX-TRK (Auxiliary Trunk) on page 481 for related trunk information.

AUX-TRK (Auxiliary Trunk)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
AUX-TRK	MAJOR[2]	**test port *location* l**	Auxiliary Trunk
AUX-TRK	MINOR	**test port *location* l**	Auxiliary Trunk
AUX-TRK	WARNING	**test port *location* sh**	Auxiliary Trunk

1 For information on specifying a location, see Command Syntax on page 179.

2 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75% of the trunks in this trunk group are alarmed.

The TN763B/C/D and TN417 Auxiliary Trunk circuit packs are used to provide ports for the following features: Music-On-Hold, loudspeaker paging (voice and coded chimes), dictation, automated wake-up with AUDICHRON. Recorder/Announcer, and recorded announcements. TN763C circuit packs support Mu-law companding. TN417 circuit packs support A-law companding. TN763D can support either companding mode and defaults to mu-law on initialization. Companding modes are administered on the ***location-parameters*** screen.

Use the following commands to administer the features:

Command	Administration
change system-parameters features	Music-On-Hold
change paging loudspeaker	loudspeaker paging
add trunk-group [Customer-Provided Equipment (CPE)]	loudspeaker paging
change paging loudspeaker	system-provided paging
add trunk-group	access to otherwise-provided (CPE) paging
change paging code-calling-ids	translation for code chiming
add trunk-group (CPE)	Recorded announcement and dictation
change system-parameters hospitality	Automatic wake-up (ses all four ports on a TN763B Auxiliary Trunk circuit pack)

Music-On-Hold provides audible feedback to a held, parked, or otherwise split-away party indicating that the call is still connected. The feedback can be customer-provided music, a recorded message, or other audible indication. Since the Music-On-Hold port is always busy, some of its port tests always abort.

The Loudspeaker Paging feature provides voice and/or code calling chime paging. If multiple paging zones are provided at a customer's premises, the Loudspeaker Paging feature gives a user the option of paging to a particular zone or to every zone. If a zone is active for one page, it cannot be used at the same time for another.

An Auxiliary Trunk circuit pack contains four ports and uses DTMF signaling. A different hardware interface between the switch and the auxiliary equipment is used for the four types of signaling that the auxiliary trunk circuit pack supports.

The interface used for the Communication Manager loudspeaker paging consists of the following three pairs:

- The Tip-Ring (T-R) pair used for voice transmission.
- The S (S-S1) pair that carries answer supervision and/or make busy information.
- The SZ (SZ-SZ1) pair that provides the external equipment with a seizure indication.

The interface used for recorded announcement, dictation, and other loudspeaker paging consists of the following two pairs:

- The Tip-Ring (T-R) pair used for voice transmission.
- The S (S-S1) pair that carries answer supervision and/or make busy information.

The interface used for Music-On-Hold consists of one pair:

- The Tip-Ring (T-R) pair used for voice transmission.

The interface, used for automatic wake-up using an Audichron recorder/announcer unit, consists of the following two pairs:

- The Tip-Ring (T-R) pair used for voice transmission.
- The S (S-S1) pair that carries the synchronization signal.

Error Log Entries and Test to Clear Values

Table 209: Auxiliary Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1(a)	57481	None			
1(b)	57782				
15(c)	Any	Audit Update test (#36)			
18	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
130(d)		None	WARNING	ON	**test trunk** *grp/mbr* **sh**
769(b)	57482	None			
257		Hybrid/Conference	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 3**

Table 209: Auxiliary Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/ Off Board	Test to Clear Value
		Circuit test (#33)			
513		NPE Crosstalk test (#6)	MINOR WARNING [2]	ON	**test port** *UUCSSpp* **l r 3**
1025		Diagnostic test —Auxiliary Trunk test (#114)	WARNING	ON	**test port** *UUCSSpp* **sh r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major or Minor alarms may be downgraded to Warning alarms based on the values used in the **set options** command.

Notes:

a Error Type 1 with Aux Data 57481 indicates a port fault. Use an empty port if one is available until the circuit pack can be replaced.

b Error Type 1 or 769 with Aux Data 57482 indicates a fault on signaling lead, which is an off-board error. This error should only occur with loudspeaker paging. If the trunk is being used for another application, check that the administration is correct. Otherwise, check the wiring to the external equipment connected to the Auxiliary Trunk and check the external equipment.

c This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors.

d Indicates the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reseat or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Looparound and Conference* test (#33), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Looparound and Conference test (#33)		X	ND
NPE Crosstalk test (#6)		X	ND
Diagnostic test (#114)	X	X	ND
Audit Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 210: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times
1000	ABORT	System resources required to run test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve TTR-LEV errors. **2** Resolve TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use the **display port *UUCSSpp*** command to determine the trunk group/member number of the port. Use the **status trunk** command to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 210: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
2020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The Network Processing Element (NPE) of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. This problem may be caused by defective Tone Detectors. **1** Test every Tone-Clock circuit pack, and resolve any errors on these circuit packs before any action is taken on the auxiliary trunk circuit pack. Then, repeat the test. **2** If the test fails again, replace the auxiliary trunk circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

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Looparound and Conference Test (#33)

This test checks the reflective loop around and conference capabilities of an auxiliary trunk port circuit. The test uses 404-Hz, 1004-Hz, and 2804-Hz tones. Each tone is separately transmitted through the loop and checked. All of these tests are performed on-board.

Table 211: Test #33 Looparound and Conference Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 211: Test #33 Looparound and Conference Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
7	FAIL	The conference capabilities of the port failed. **1** If no service problems exist on the port, continue to use the port until the circuit pack can be replaced.
129	FAIL	The reflective 404-Hz tone test failed, no transmission was detected to or from the port. The problem may be off-board.
131	FAIL	The reflective 1004-Hz tone test failed. No transmission was detected to or from the port. The problem may be off-board.
133	FAIL	The reflective 2804-Hz tone test failed. No transmission was detected to or from the port. The problem may be off-board. **1** To make sure the problem is on-board, disconnect the port from the auxiliary equipment and retry test. **2** If the test fails, replace the circuit pack. Otherwise, if the test passed after disconnecting the port from the auxiliary equipment, the problem is off-board. Check the wiring and connections to the auxiliary equipment and retry the test after reconnecting the port to the auxiliary equipment. If the test fails, check the auxiliary equipment. See the preceding procedure for a failure with Error Code 7. **NOTE:** If the Looparound and Conference test fails for every port on a circuit pack, a -5 Volt power problem is indicated. If a TN736 or TN752 power unit circuit pack is present, the 631DB AC power unit or the 676B power unit may be defective. The system may contain either a TN736 or a TN752 power unit circuit pack OR a 631DB power unit, *but not both types of power units.* To investigate power problems, see CARR-POW (Carrier Power Supply) on page 578.
	PASS	Looparound and Conference test is successful. This port is functioning properly.

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Audit Update Test (#36)

This test will send updates of the auxiliary trunk port translation for every port on the Auxiliary Trunk circuit pack that has been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack. No response message is expected from the circuit pack once it receives translation updates. The port translation data includes:

- Trunk type
- DTMF time slot
- Termination R/RC
- Gain, high/low
- End-to-end signaling, tone, and pause duration
- Trunk state, idle/active/unavailable
- Companding mode (A-law or mu-law)

Table 212: Test #36 Audit Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1006	ABORT	Port is in out-of-service state as a result of being busied out. This audit cannot be run. **1** Retry the command once the port is in service (**release port *UUCSSpp*** command has been run).
2100	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	This test passed. Translation information was successfully updated on the circuit pack.

Diagnostic Test—Auxiliary Trunk Test (#114)

The system software sends a message to the on-board microprocessor to operate a relay in the port circuit. If ground is detected, the test passes.

Table 213: Test #114 Diagnostic Test—Auxiliary Trunk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle. **2** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	This test failed to detect ground. **1** Try the test once more. **2** If the test fails again, replace the circuit pack.
	PASS	This test passed. Ground was detected.

AXA12-BD/ADX8D-BD/AXD12-BD (AUDIX Circuit Packs)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
AXA12-BD	MINOR	**test board *location*[1] sh**	AUDIX circuit pack
AXA12-BD	WARNING	**test board *location* sh**	AUDIX circuit pack
ADX8D-BD	MINOR	**test board *location* sh**	AUDIX circuit pack
ADX8D-BD	WARNING	**test board *location* sh**	AUDIX circuit pack
AXD12-BD	MINOR	**test board *location* sh**	AUDIX circuit pack
AXD12-BD	WARNING	**test board *location* sh**	AUDIX circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

The TN568 is an EMBEDDED AUDIX circuit pack that occupies 2 slots in a port carrier. The tests below apply only to switch-side maintenance, which tests a circuit pack's components related to the TDM-bus interface. The AUDIX system has an extensive maintenance strategy of its own that is described in EMBEDDED AUDIX System Maintenance, 585-300-110.

AXA12-BD:

TN568 EMBEDDED AUDIX circuit packs (sometimes called Embedded AUDIX) operating in control-link mode appear to the system as TN746 Analog Line circuit packs with vintage greater than 50. For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. The maintenance strategy for ports on the TN568 operating in control-link mode is described in ADXCL-PT.

ADX8D-BD:

TN568 EMBEDDED AUDIX circuit packs operating in 8-port digital mode appear to the system as TN754 Digital Line circuit packs with vintage greater than 50. For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. The maintenance strategy for ports on the TN568 operating in 8-port digital mode is described in ADXDP-PT.

ADX12-BD:

The ADX12-BD MO represents a TN568 EMBEDDED AUDIX circuit pack operating in 12-port digital (DP) mode. TN568 EMBEDDED AUDIX circuit packs operating in 12-port digital mode appear to the system as TN2181 Digital Line circuit packs with vintage greater than 50. For circuit-pack-level problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. Port-level problems are covered by ADX12D-PT.

AXA12-RS/ADX8D-RS/AXD12-RS (AUDIX Reserve Slots)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
AXA12-RS	NONE	NONE	TN568 12-port analog reserve slot
ADX8D-RS	NONE	NONE	TN568 8-port digital reserve slot
AXD12-RS	NONE	NONE	TN568 12-port digital reserve slot

There are no tests associated with these MOs. Both the **test board** and **busyout board** commands abort when either is attempted on a reserved slot. An error message indicates that the slot is associated with the circuit pack that the TN568 is emulating, but the requested operation is not valid. If there are errors logged against these MOs, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

The TN568 circuit pack connects to the switch through a single slot in the backplane; however, the number of slots physically occupied by the circuit pack is supplied by the board when inserted. The TN568 is 2 slots wide: the functional slot and a reserve slot. The reserve (blank) slot to the left of the functional slot is a place holder on the switch and has no interaction with the switch.

These MOs are place holders for the extra slot needed for the EMBEDDED AUDIX board. Each instance of these MOs represents a reserve slot associated with the respective circuit pack mode in which the TN568 (EMBEDDED AUDIX) is working. They are used for EMBEDDED AUDIX and emulation of respective port types.

BRI-BD/LGATE-BD (ISDN-BRI Line Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
BRI-BD	MAJOR	**test board *location* l**	ISDN-BRI Line circuit pack
BRI-BD	MINOR	**test board *location* l**	ISDN-BRI Line circuit pack
BRI-BD	WARNING	**test board *location* sh**	ISDN-BRI Line circuit pack
LGATE-BD	MAJOR	**test board *location* l**	DEFINITY LAN Gateway
LGATE-BD	MINOR	**test board *location* l**	DEFINITY LAN Gateway
LGATE-BD	WARNING – (See Caution)	**test board *location* sh**	DEFINITY LAN Gateway

1 For information on specifying a location, see Command Syntax on page 179.

CAUTION:

A detailed flowchart for isolating and resolving Packet Bus faults is included in Isolating and repairing packet-bus faults in *Maintenance Procedures (555-245-103)*. This flowchart, along with the other information presented in the chapter, can help in resolving problems that involve more than a single station or circuit pack. Whenever the repair procedures for this Maintenance Object refer to Packet Bus and/or Packet Control maintenance, be sure to see Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**). See also PKT-BUS (Packet Bus) on page 1406 for repair procedures.

This section relates to the TN556 ISDN BRI, TN2198 ISDN BRIU, TN2208 Ethernet, (LGATE)-Ethernet Multifunction (MFB) boards.

The TN2208 LGATE MFB provides the system with the interface to Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). This circuit pack contains 12 ports for line circuit interface (although only 8 are usable by the switch), each of which operates with two B channels and 1 D channel. In this context, the term "ISDN-BRI port" is used to refer to ports on the TN2208 MFB circuit pack that are connected to ASAI or Avaya adjuncts. The TN2208 LGATE MFB is handled by the switch software as if it is an ISDN-BRI compatible board, and every maintenance action referring to ASAI and Avaya adjunct links in this section applies.

The TN556, TN2198, and TN2208 ISDN-BRI Lines are packet port circuit packs that provides access to ISDN-BRI endpoints. The ISDN-BRI Line circuit packs supports 12 ports, each of which provides access to ISDN stations. Voice and circuit-switched data from the ISDN stations are carried on the Time Division Multiplex (TDM) Bus. Signaling is carried over the packet bus.

LEDS

The ISDN-BRI Line circuit pack performs extensive initialization tests and lights both the red and green LEDS during the initialization testing. See Chapter 2, "LEDs", for more details on circuit pack status LEDs.

Hardware Error Log Entries and Test to Clear Values

Table 214: BRI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **sh r 1**
1(a)	Any	None	MINOR	ON	
18(b)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board** *UUCSS*
23(c)	0	None	WARNING	OFF	
257(d)	65535	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **r 20**
513(e)	4352 to 4357				
769(f)	4358				
1025(g)	4363	NPE Audit test (#50)			
1293 to 1294 (h)	46088 to 46096	SAKI Sanity test (#534)	MINOR	ON	See footnote (h)
1537 to 1538 (i)	46082		MINOR	ON	
1793 (j)	46080		MINOR	ON	
1794 (j)	46094		MINOR	ON	
1795 (j)	46085		MINOR	ON	
2306 (j)		LANBIC Receive Parity Error Counter test (#595)			
3330 (k)	46083		MINOR	OFF	
3840 (l)	4096 to 4101				

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Table 214: BRI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3843 (m)	46097				
3999 (n)	Any	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a Error 1 indicates the circuit pack totally stopped functioning or it was physically removed from the system.

NOTE:
The alarm is logged approximately 11 minutes after the circuit pack has been removed and/or SAKI Sanity test (#53) fails.

If the circuit pack is not in the system, insert a circuit pack (in the same slot as the error indicates) to resolve this error. Or, if the circuit pack is in the system and the red LED is on, then follow the instructions for "Red (alarm)" in Circuit pack LEDs on page 27.

b This circuit pack has been busied out via the **busyout board *UUCSS*** command.

c Port(s) has (have) been administered on this circuit pack but the circuit pack is not physically present.

d This error indicates transient communication problems between the switch and this circuit pack. Execute the **test board *UUCSS*** command and see Control Channel Loop-Around Test (#52) on page 1973 for the repair procedures.

e An on-board hardware failure has been detected by the circuit pack.

The reported aux data values correspond to the following detected errors:

4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4357	Instruction set error

Reset the circuit pack by executing **busyout board *UUCSS*** and **reset board *UUCSS***. When it is reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one of these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedure in footnote (a) for error type 1.

f This error is reported by the circuit pack when it detects a program logic error. While no action is required, this error may lead to errors of other types being reported against this circuit pack.

g This error is reported by the circuit pack when it cannot update NPE memory and read it back. This error type can be ignored, but may lead to errors of other types being reported against this circuit pack.

h A critical hardware failure has been detected on the circuit pack. Reset the circuit pack via **busyout board *UUCSS*** and **reset board *UUCSS***. If the Circuit Pack Restart test (#594) passes, then the on-board circuitry is healthy. Retire the alarm via **test board *UUCSS* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

The reported error types correspond to the following detected errors:

1293	On-board auxiliary processor insane
1294	Internal memory access error

i These error types are reported when the following errors are detected:

1537	Frame overrun at packet-bus interface. This condition may be caused by an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those MOs.
1538	Circuit packet is hyperactive; that is, it is flooding the switch with messages sent over the control channel. The circuit pack is taken out-of-service when a threshold number of these errors is reported to the switch. Clear the alarm via the following commands: **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long clear**, **release board *UUCSS***. If the error recurs within 10 minutes, then replace the circuit pack.

j These errors indicate that the circuit pack is having problems transmitting data to the packet bus.

1793	Parity errors are detected when transmitting data to the packet bus.
1794	Overflow of packet-bus transmit buffers has occurred.
1795	Circuit pack cannot find end of frame when transmitting to packet bus. Clear the alarm via the following commands: **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long clear**, **release board *UUCSS***. If the error recurs within 10 minutes, then replace the circuit pack.
2306	This error occurs when the circuit pack detects an error in a received frame from the packet bus. These errors are most likely caused by a packet-bus problem, but may be due to a circuit pack fault. An invalid Link Access Procedure Data (LAPD) frame error occurs if the frame contains a bad cyclical redundancy check (CRC), is greater than the maximum length, or violates the link level protocol. When bus parity errors are reported, the LANBIC Receive Parity Error Counter test (#595) should be performed to determine whether the condition had cleared. See Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)* to determine whether the problem is isolated to this circuit pack or is caused by packet-bus faults.

k A critical failure has been detected in the packet-bus interface of the circuit pack. This failure may be due to either a packet-bus or to an on-board fault. If the packet bus is alarmed, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 and Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in Maintenance Procedures (555-245-103) for recommended repair procedures. The probability of this error being related to packet-bus problems increases with the number of ISDN-BRI circuit packs displaying this error.

If the packet bus is not alarmed, reset the circuit pack via the **busyout board *UUCSS*** and **reset board *UUCSS*** commands. If the Circuit Pack Restart test (#594) passes, then the on-board circuitry is healthy. Retire the alarm via the **test board *UUCSS* long clear** command. If the Circuit Pack Restart test (#594) fails, replace the circuit pack. If the problem persists after complying with the above instructions, then follow normal escalation procedures.

l These errors are not service-affecting. No action is required. These errors are reported by the circuit pack when it receives a bad control channel message from the switch. The auxiliary data identifies the following error events:

4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Inconsistent downlink message

m This error is not service-affecting. No action is required.

3843	Bad translation RAM detected, but call continues by using another translation location.

n This error indicates that the circuit pack sent a large number of control channel messages to the switch in a short period of time.

3999	If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 absent, then the circuit pack was not taken out-of-service, but has generated 50% of the messages necessary to be considered hyperactive. This may be normal during heavy traffic periods. If traffic is light, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. For example, by clearing error codes associated with the *Control Channel Loop Around* test (#52), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-Around test (#52)	X	X	ND
NPE Audit test (#50)		X	ND
LANBIC Receive Parity Error Counter test (#595)		X	ND

1 D = Destructive; ND = Nondestructive

NPE Audit Test (#50)

See the repair procedure described in XXX-BD (Common Port Circuit Pack) as NPE Audit Test (#50) on page 2093.

Control Channel Loop Around Test (#52)

See the repair procedure described in XXX-BD (Common Port Circuit Pack) as Control Channel Loop-Around Test (#52) on page 2096.

SAKI Sanity Test (#53)

Refer to the repair procedure described in XXX-BD (Common Port Circuit Pack) as SAKI Sanity Test (#53) on page 2097.

LANBIC Receive Parity Error Counter Test (#595)

This test is **destructive**.

The test reads and clears the LANBIC Receive Parity Error Counter on the circuit pack. This counter is incremented by the circuit pack when it detects a parity error in data received from the packet bus.

These errors may indicate a circuit-pack problem, packet-bus problem, or a problem with another circuit pack on the bus. This test is useful for verifying the repair of the problem.

Table 215: Test #595 LANBIC Receive Parity Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to five times, reset the circuit pack via the **busyout board *UUCSS*** and **reset board *UUCSS*** commands. **2** If the test aborts again, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
1–10	FAIL	The circuit pack is still detecting errors of this type. The error code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, verify the validity of the packet bus. Run the Packet Bus Maintenance test, **test pkt *P* long**. If any packet-bus tests fail, see PKT-BUS (Packet Bus) on page 1406 for recommended repair procedures. **3** If the Packet Bus test passes, check the validity of the circuit pack. Execute a test that involves data transmission onto the packet bus. For example, the BRI may use the connectivity tests of the port-level MO (BRI-PORT) by executing **test port *UUCSSpp***. Refer to the repair procedures for the executed test if it fails. Otherwise, proceed to the next step. **4** Other circuit packs on the packet bus can cause of the parity error. Use **display errors** to check the Error Log for other circuit packs that are alarmed. If any alarms are present for the other circuit packs, retire those alarms also. Then, rerun the LANBIC Receive Parity Error Counter test (#595) on this circuit pack.
	PASS	No errors detected by circuit pack.

BRI-DAT (ISDN-BRI Data Module)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
BRI-DAT	WARNING[1]	**test data-module**	ISDN-BRI Stand-alone Data Module

1 The alarm level for ASAI or Avaya adjuncts may be administered using the **set options** command. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI adjunct in the system.

Refer to BRI-SET, BRI-DAT, Various Adjuncts on page 520.

BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
BRI-PORT	MINOR	**test port *location* l**	ISDN-BRI port
BRI-PORT	WARNING	**test port *location* sh**	ISDN-BRI port
ABRI-PORT	MAJOR[2,3]	**test port *location* l**	ASAI ISDN-BRI port
ABRI-PORT	WARNING[2,3]	**test port *location* l**	ASAI ISDN-BRI port
ATT-PORT	MAJOR [2], [3]	**test port *location* l**	Avaya Adjunct ISDN-BRI port
ATT-PORT	WARNING [2], [3]	**test port *location* l**	Avaya Adjunct ISDN-BRI port
LGATE-PT	MAJOR [2], [3]	**test port *location* l**	Ethernet ASAI port
LGATE-PT	WARNING [2], [3]	**test port *location* l**	Ethernet ASAI port
ATTE-PT	MAJOR [2], [3]	**test port *location* l**	Ethernet Avaya Adjunct port
ATTE-PT	WARNING [2], [3]	**test port *location* l**	Ethernet Avaya Adjunct port

1 For information on specifying a location, see Command Syntax on page 179.

2 The alarm level for ASAI and Avaya adjunct ports may be administered using the **set options** command. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI and Avaya adjunct port in the system.

3 All alarming for an ASAI and Avaya adjunct and OFF-BOARD alarming for an ASAI or Avaya port is disabled if the ASAI or Avaya adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm is logged against the ASAI or Avaya adjunct. The Hardware Error and Alarm Logs should be checked to see if the adjunct has disabled alarming.

NOTE:
Some of the information in this section is reserved for future use.

CAUTION:
The section, Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in Maintenance Procedures (555-245-103), along with the other information presented in the chapter, can help resolve problems involving more than one station or circuit pack.

WARNING:
If a significant packet-bus failure occurs, errors and alarms may not be logged as expected for BRI-PORT/ABRI-POR/ATT-PORT/ LGATE-PT/ ATTE-PT. Conditions under which this occurs are detailed in Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)*.

The TN2208 LGATE MFB provides Communication Manager with the interface to Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). The circuit pack contains 12 ports of line circuit interface (although only 8 are usable by the switch), each of which operates with two B channels (referred to as B1 and B2 throughout this section) and one D channel. In this context, the term “ISDN-BRI port” is used to refer collectively to ports on the TN2208 circuit pack that are connected to ASAI or Avaya adjuncts.

The TN556 and TN2198 ISDN-BRI Line circuit packs provide the system with the interface to ISDN-BRI endpoints, Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). The circuit packs contain 12 ports of line circuit interface, each of which operates with two B channels (referred to as B1 and B2 throughout this section) and one D channel. In this context, the term “ISDN-BRI port” is used to refer collectively to ports on the TN556 an TN2198 circuit packs that are connected to either BRI endpoints, ASAI or Avaya adjuncts.

For BRI endpoints, each B channel may support voice or circuit-switched data and may be circuit-switched simultaneously. The B channels are not used on ports connected to ASAI or Avaya adjuncts. The D channel is used for conveying signaling between the switch and a BRI endpoint(s), ASAI or Avaya adjunct. Each ISDN-BRI D channel is connected to the switch processor and the ISDN-BRI port through the packet bus.

ISDN-BRI endpoints are available in various configurations. Every endpoint requires the D channel to convey signaling information to the switch. Only one B channel is required for a voice-only set or a stand-alone data module (BRI-DAT). A voice and data-capable set requires both B channels (one for voice and one for data). Therefore, each TN556 or TN2198 port can support either two voice-only sets, two stand-alone data modules (BRI-DAT), or one voice and data-capable set. Only a single ASAI or Avaya adjunct may be connected to an ISDN-BRI port. Multiple adjuncts per line are not supported.

Figure 32, ISDN-BRI Port Interactions, on page 501 illustrates the physical connection (solid line) between an ISDN-BRI port and its associated ISDN-BRI set(s). Each physical connection allows for two B channels and one D channel. Each ISDN-BRI circuit pack can support up to 12 of these *physical* connections to different voice and voice/data sets or ASAI or Avaya adjuncts. On a TN2198 each ISDN-BRI circuit pack can support up to 12 *physical* connections to a NT1 which in turn connects to 2 terminals.

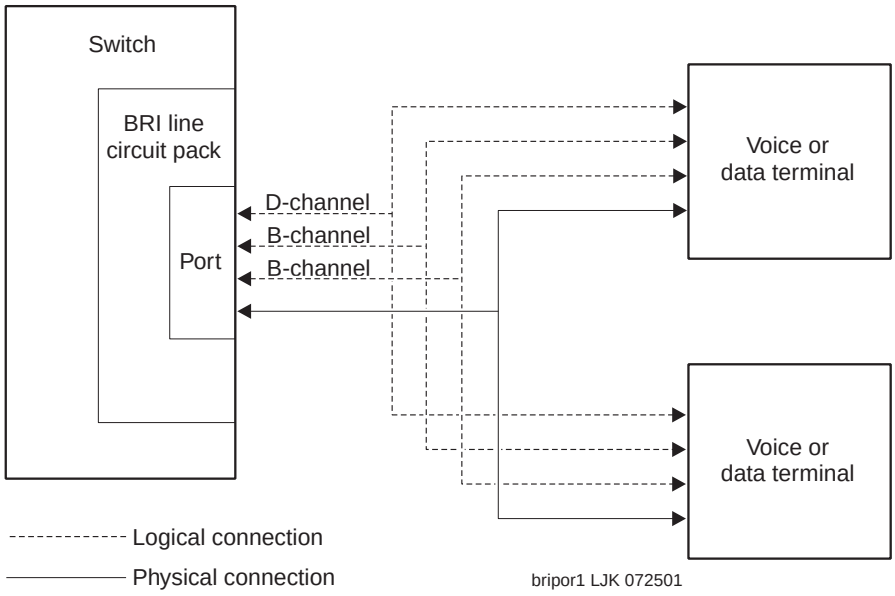
This section covers the maintenance documentation for ISDN-BRI ports. Some of the results of maintenance testing of ISDN-BRI ports may be affected by the health of the ISDN-BRI Line circuit pack (BRI-BD), BRI endpoint (BRI-SET), or ASAI adjunct (ASAI-ADJ/LGATE-AJ/LGATE-AJ) or Avaya adjunct (ATT-ADJ/ATTE-AJ). These interactions should be kept in mind when investigating the cause of ISDN-BRI port problems. For more information about the circuit pack, see:

- BRI-BD/LGATE-BD (ISDN-BRI Line Circuit Pack) on page 491
- BRI-SET, BRI-DAT, Various Adjuncts on page 520

and its endpoints, see:

- ASAI-ADJ (ASAI Adjunct) on page 330
- ATT-ADJ (AvayaAdjunct), ATTE-AJ (Ethernet Avaya Adjunct) on page 477
- LGATE-AJ on page 1165

Figure 32: ISDN-BRI Port Interactions



Hardware Error Log Entries and Test to Clear Values

Table 216: ISDN-BRI Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level BRI-PORT	Alarm Level ABRI-PORT ATT-PORT LGATE-PT ATTE-PT	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	Any	**test port** *PCSSpp* **sh r 1**
1(a)	(a)	Level 1 Status Inquiry (#621)	WARNING	MAJOR MINOR WARNING[2]	OFF	**test port** *PCSSpp* **sh r 2**
18		**busyout port** *PCSSpp*	WARNING		OFF	**release port** *PCSSpp*
130(b)			WARNING		ON	**test port** *PCSS* **sh**
257(c)	(c)	EPF Inquiry (#622)	WARNING	MAJOR MINOR WARNING[2]	OFF	**test port** *PCSSpp* **sh r 1**
513(d)	(d) 46222	none	(d)	(d)	ON	
769(e)	0	none	WARNING	MAJ	OFF	
1281(f)		NPE Crosstalk (#617)	MINOR WARNING[2]		ON	**test port** *PCSSpp* **l r 2**
1537(g)	46210	CRC Error Counter (#623)	WARNING	MAJOR MINOR WARNING[2]	OFF	
1793(h)		BRI Port Local TDM Loop Around (#619)	MINOR WARNING[2]		ON	**test port** *PCSSpp* **l r 2**
3841(i)	46208	None				
3842(j)	0	None				
3843(k)	0	None				
3844(l)	46223	None				
3845(m)		None				

1 of 2

Table 216: ISDN-BRI Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level BRI-PORT	Alarm Level ABRI-PORT ATT-PORT LGATE-PT ATTE-PT	On/ Off Board	Test to Clear Value
3846(n)	TEI	None				
3847(o)	0	None				

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major and Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the set options command.

Notes:

a **Error Type 1** – This error occurs when the Level 1 Status Inquiry fails or when the BRI circuit pack detects that Level 1 has been deactivated on the port. The aux data field contains one of the following values:

- blank – This indicates that the Level 1 Status Inquiry failed.
- 32773 – This is a message from the BRI-LINE circuit pack indicating Level 1 has been deactivated.

Refer to the repair procedures for Test #621.

b **Error Type 130** – This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

c **Error Type 257** – This error occurs when the EPF Status Inquiry fails due to an overcurrent condition or when the BRI-LINE circuit pack detects that the EPF is in an over current condition. The aux data field contains one of the following values:

- blank – This indicates that the EPF Status Inquiry failed due to an overcurrent condition.
- 40988 – This indicates that the BRI-LINE circuit pack has detected an overcurrent condition and has turned the EPF off.

Execute the short test sequence, and see the repair procedures for Test #622.

d **Error Type 513** – This error indicates that the circuit pack is having problems transmitting data to the packet bus, thus affecting the conveyance of signaling information over the D channel. With Aux Data 46222, this error occurs when the packet-bus transmit buffers overflow. This condition probably indicates a hardware problem. The BRI-PORT Alarm Level for the error with Aux Data 46222 is "MINOR/WARNING," and the ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT Alarm Level is "MAJOR/MINOR/WARNING." With Aux Data 0, this error occurs whenever the packet-bus transmit FIFO buffers overflow. This condition can be caused by an on-board hardware problem as well as by problems on the packet bus that disrupt the BRI circuit pack's ability to transmit data onto the packet bus. Use troubleshooting procedures for both on-board hardware problems and potential off-board packet-bus problems. See PKT-BUS (Packet Bus) on page 1406 as well as Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)* for more information about troubleshooting the packet bus. The BRI-PORT Alarm Level for the error with Aux Data 0 is "MINOR," and the ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT Alarm Level is "MAJOR."

e **Error Type 769** – This error occurs when the NPE Crosstalk test (#617) fails. Run the long test sequence, and pay particular attention to the results of Test #617.

f **Error Type 1281** – This error occurs when a port's associated broadcast-signaling links have too much traffic related to link establishment. This could occur if an endpoint on this port is sending link establishment traffic on a port level broadcast link or if there are Level 1 problems on the port. Check the error logs for Level 1 errors. If Level 1 problems exist, follow the repair procedures listed for Test #621. Software will suspend activity to this port for 75 minutes when the port is alarmed due to this error (note that service suspension does not occur if the port is an ABRI-PORT/LGATE-PT/ATTE-PT/ATT-PORT). If this problem persists, replace the endpoint or endpoints associated with this port. If replacing the endpoints does not fix the problem, follow normal escalation procedures.

g **Error Type 1537** – This error occurs when the port receives an invalid frame over the D channel. When CRC errors exceed five within 15 minutes, the port is taken out of service for five seconds. If five more CRC errors are received within 15 minutes of the first set of five errors, the port is taken out of service for one minute. If five more CRC errors are received within 15 minutes of the last five, the port is taken out of service for 15 minutes.

This error is most likely due to a problem with the wiring to the set or adjunct, interference on the wiring due to a noise source, or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

- Check the wiring to the endpoints or the adjunct.
- If the problem persists, replace the endpoints or adjuncts, or escalate the problem.

h **Error Type 1793** – This error occurs when the BRI Port Local TDM Loop Around test (#619) fails. Run the long test sequence, and pay particular attention to the results of Test #619.

There are no Test to Clear Values for the following error types. The error types are simply provided as additional data that may prove useful while troubleshooting.

i **Error Type 3841** – This error occurs when a Layer 1 Transmission error is detected for the port. Run the long test sequence, and pay particular attention to the results of the Layer 1 Transmission Error Counter test (#624).

j **Error Type 3842** – A BRI port supports up to three Terminal Endpoint Identifiers (TEIs). This error occurs when the switch receives a request for a fourth TEI on a port. Check the number of endpoints administered for this port.

k **Error Type 3843** – This error occurs when an SPID initialization request is made from an endpoint and the switch determines that the SPID value is invalid or is a duplicate of another SPID that is already initialized at Layer 3 on the port. Check the administration of the endpoints.

l **Error Type 3844** – This error occurs when the circuit pack detects an overflow of its receive buffers. Run the long test sequence, and pay particular attention to the results of the Receive FIFO (First In First Out) Overflow Error Counter test (#625).

m **Error Type 3845** – This error occurs when the BRI Port Local LAN Loop Around test (#618) fails. Run the long test sequence, and pay particular attention to the results of Test #618.

n **Error Type 3846** – This error most likely occurs when the Terminal Endpoint Identifier (TEI) administered for the ASAI or Avaya endpoint does not match the TEI administered in the ASAI or Avaya adjunct. Check the switch administration of the TEI against that of the adjunct and make sure that both are using the same TEI.

o **Error Type 3847** – Indicates that sets on the port do not support layer-3 initialization. Consult the Service Set documentation.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. For example, by clearing error codes associated with the *NPE Crosstalk* test (#617), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#617)		X	D
BRI Port Local LAN Loop Around test (#618)		X	D
BRI Port Local TDM Loop Around test (#619)		X	D
Electronic Power Feed Restoral test (#620)	X	X	ND
Level 1 Status Inquiry test (#621)	X	X	ND
Electronic Power Feed Inquiry test (#622)	X	X	ND
CRC Error Counter test (#623)		X	ND
Layer 1 Transmission Error Counter test (#624)		X	ND
Receive FIFO Overflow Error Counter test (#625)		X	ND
Clear Error Counters (#270)	X	X	ND

1 D = Destructive; ND = Nondestructive

NOTE:
The NPE Crosstalk test and the BRI Port Local TDM Loop Around test are not executed for ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT.

NPE Crosstalk Test (#617)

This test is **destructive**.

One or more NPEs reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's long test sequence and executes in approximately 20 to 30 seconds. Crosstalk testing is performed on both B channels (B1 and B2) associated with a BRI port. If this test fails on either channel, any endpoint connected to the port is taken out-of-service.

This test is not executed for ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT because the B channels associated with the port are not used by ASAI or Avaya adjuncts.

Table 217: Test #617 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *PCSSpp*** to determine the station extension or trunk group/member number of the port. Use **status bri-port *PCSSpp*** to determine the service state of the port. If the service state indicates that the port is active, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 1, "Maintenance SAT Commands" in Maintenance Commands Reference (555-245-101) for a full description of every possible state.) Wait until the port is idle before retesting. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. **1** Use **status station** for the station associated with this port and determine when the port is available for testing. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	This test is not valid for this type of translation. Ports administered as "ASAI" or "ADJK" cannot run this test, because the B channels associated with the port are not used by ASAI or Avaya Adjunct Links. This is a normal condition.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. Error code 1 indicates that the NPE Crosstalk test failed on Channel B1. Error code 2 indicates that the NPE Crosstalk test failed on Channel B1. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** To verify that this is not an intermittent problem, repeat this test up to 10 times to make sure it continues passing. **2** If complaints still exist, examine the station, connections, and wiring.

BRI Port Local LAN Loop Around Test (#618)

This test is **destructive**.

This test verifies the connectivity of a BRI port across the LAN Bus and executes only if the port is out-of-service. The test aborts if calls associated with the port are in-progress. Failures of this test indicate either on-board faults associated with the BRI-PORT hardware on the circuit pack, or problems with the LAN Bus, which is used to form connectivity between the switch and the BRI-PORT.

The dotted lines in Figure 33, Path of the BRI Port Local LAN Loop Around, on page 507 show how a Loop Around test is performed across the packet bus for the D channel.

Figure 33: Path of the BRI Port Local LAN Loop Around

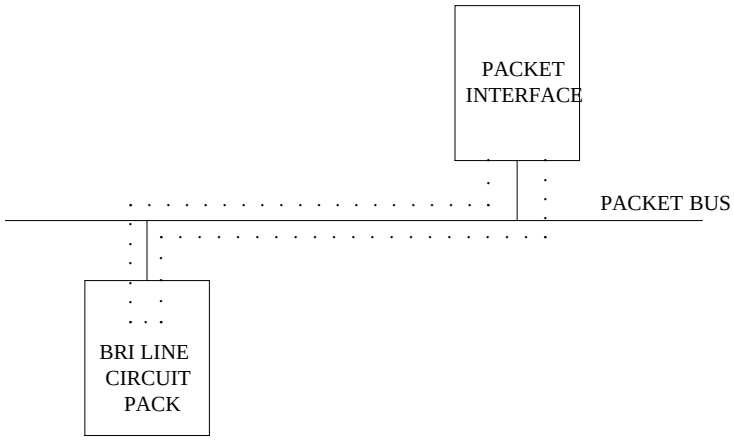

Table 218: Test #618 BRI Port Local LAN Loop Around

Error Code	Test Result	Description / Recommendation
1015	ABORT	The port is not in the out-of-service state. **1** Display the BRI Port Status screen via the **status bri-port *PCSSpp*** command to determine what stations or adjuncts are on this port. **2** Use the extension shown on this screen in **status station** to determine whether the station or adjunct is active. **3** If so, wait until it is idle, and then busyout the port (using the **busyout port *PCSSpp*** command) to place it in the out-of-service state and repeat this test. **WARNING:** Since the "busyout" command is destructive, execution of this command prior to the port being idle causes every call associated with BRI endpoints and every transaction associated with ASAI or Avaya adjuncts on the port to be torn down. Note that 3rd-party calls established by an ASAI or Avaya adjunct remain connected even though the port is taken out-of-service.
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute the **test port long *PCSSpp*** command, and review the results of the BRI Port Local LAN Loop Around test to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Follow the repair procedures for the PKT-CTRL. **2** After completing step 1, execute the **test port long *PCSSpp*** command, and review the results of the BRI Port Local LAN Loop Around test to verify the repair.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus. **2** After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

1 of 2

Table 218: Test #618 BRI Port Local LAN Loop Around

Error Code	Test Result	Description / Recommendation
	FAIL	The Loop Around test has failed. **1** If the test fails repeatedly, attempt to reset the circuit pack if the other ports on the board are idle. Reset the circuit pack by issuing the **busyout board *PCSS*** and the **reset board *PCSS*** commands. **2** If the test fails again, execute **test port-network *pn#***. If this fails, follow failure procedures in PKT-BUS (Packet Bus) on page 1406. **3** If tests executed in step 2 pass, the problem is local to the BRI board. Replace the circuit pack.
	PASS	The BRI Port Local LAN Loop Around test has passed.

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BRI Port Local TDM Loop Around Test (#619)

This test is **destructive**.

This test verifies the connectivity of a BRI port across the TDM Bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack.

This Loop Around test runs a series of individual tests on the two B channels (B1 and B2) associated with the port. It is a collection of the following:

- Loop Around test across the TDM Bus for B1.
- Conference Circuit test for B1.
- Loop Around test across the TDM Bus for B2.
- Conference Circuit test for B2.

The tests are run in the above order. If one fails, the remaining tests in the sequence are not executed. An error code is returned at that point.

This test is not executed for ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT because the B channels associated with the port are not used by ASAI or Avaya adjuncts.

The dotted lines in Figure 34, Path of the BRI Port Local TDM Loop Around, on page 510 show how a Loop Around test is performed for the B channels. The figure shows a terminal connected to a BRI line board using a TN556. If a TN2198 is used the terminal would be connected to a NT1, and the NT1 to the BRI board.

Figure 34: Path of the BRI Port Local TDM Loop Around

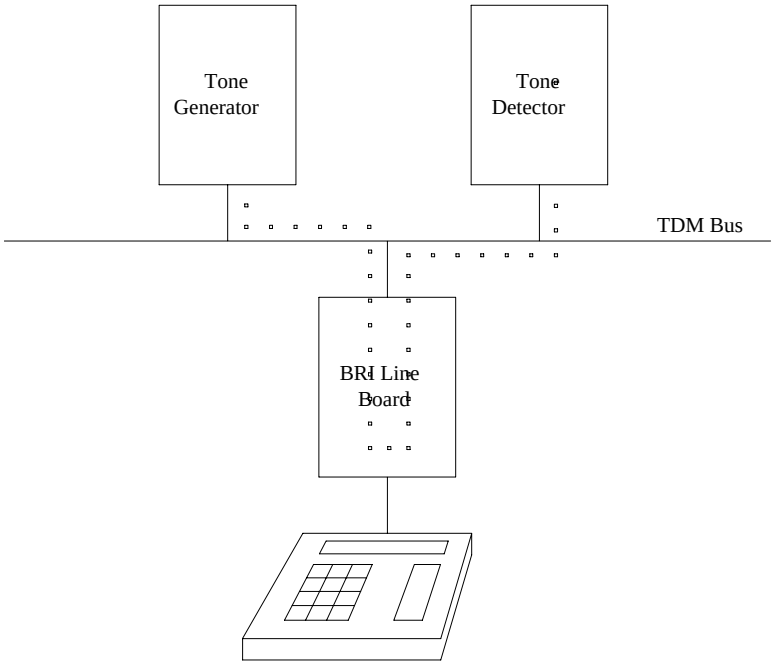

Table 219: Test #619 BRI Port Local TDM Loop Around

Error Code	Test Result	Description / Recommendation
1000	ABORT	The system resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *PCSSpp*** to determine the station extension or trunk group/member number of the port. Use **status bri-port *PCSSpp*** to determine the service state of the port. If the service state indicates that the port is active, then the port is unavailable for certain tests. (Refer to the "Status Commands" section in Chapter 1, "Maintenance SAT Commands" in Maintenance Commands Reference (555-245-101) for a full description of every possible state.) Wait until the port is idle before retesting. **2** If the port is idle, then retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 219: Test #619 BRI Port Local TDM Loop Around

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** for the station associated with this port and determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	This test is not valid for this type of translation. Ports administered as "ASAI" or "ADJK" cannot run this test, because the B channels associated with the port are not used by ASAI or Avaya Adjunct Links. This is a normal condition.
2000	ABORT	Response to the test was not received from the BRI-LINE circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack if the other ports are idle. Reset the circuit pack by issuing the **busyout board *PCSS*** and the **reset board *PCSS*** commands. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1, 2	FAIL	As stated previously, this test runs a TDM Loop Around test on each B channel. This indicates that the loop around failed on one of the channels. Error Code 1 indicates that the TDM Loop Around test failed on B1. Error Code 2 indicates that the TDM Loop Around test failed on B2.

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Table 219: Test #619 BRI Port Local TDM Loop Around

Error Code	Test Result	Description / Recommendation
7, 8	FAIL	As stated previously, this test runs a Conference Circuit test on each B channel. A failure here indicates that one of these conference tests failed; Error Code 7 means that the test failed on B1; Error Code 8 means that the test failed on B2. **1** If the test fails repeatedly, attempt to reset the circuit pack if the other ports on the circuit pack are idle. Reset the circuit pack by issuing the **busyout board *PCSS*** and the **reset board *PCSS*** commands. **2** If the test fails again, replace the circuit pack.
	PASS	The BRI Port Local TDM Loop Around test has passed.

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Electronic Power Feed Restoral Test (#620)

This test attempts to restore the Electronic Power Feed (EPF) on an ISDN-BRI port twice. In this test, the processor requests that the EPF be turned on for a given port. An attempt is made to turn on the power unit to the station or adjunct. If no current is being drawn by a station, this probably indicates that the station is not connected. No current being drawn by an adjunct is the normal condition. If an overcurrent condition is sensed (that is, too much current is being drawn), this condition may indicate a short in the wiring to the endpoint or adjunct. Depending on what condition is sensed, a message is returned stating that either the EPF was turned on successfully with no problems or that an overcurrent condition is sensed. This response is reported by the Electronic Power Feed Inquiry (#622), which follows in the testing sequence. EPF Restoral is attempted again by this test five seconds later. This test always passes for the TN2198 because it has no EPF. This test will always abort when run on the TN2208.

Table 220: Test #620 Electronic Power Feed Restoral

Error Code	Test Result	Description / Recommendation
1005	ABORT	This test is not valid for this port type. The TN2208 does not have an electronic power feed, and the test will abort.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
	PASS	The EPF test passed. The message to turn on the power feed to the station or the adjunct was successfully sent to the port. **1** Although this test should not return a fail result, after running this test, the Error Log should be checked for any entries with error type 257 to examine the real results of this test. **2** An error type of 257 in the Error Log indicates some problem with the power to the station or the adjunct. Check for a short in the wiring, a damaged jack, a defective voice terminal or adjunct, or an incorrect type of terminal.

Level 1 Status Inquiry Test (#621)

This test determines the state of the transmission facility of a BRI port at the physical layer (that is, Level 1). Level 1 can be in one of three possible states: Activated, Pending Activation, or Deactivated.

The Activated state is the correct state for an ISDN-BRI port. In this state the Level 1 interface can communicate with the BRI endpoint or ASAI or Avaya adjunct administered on this port. This test passes if the state of Level 1 (L1) is Activated. This test also passes if software has taken this port out of service. See the description of the Level 1 "Deactivated State" below for more details.

The Pending Activation state indicates a problem with the endpoints or adjunct, the wiring to the sets or adjunct, or the BRI-LINE circuit pack. When in this state, the Level 1 interface is either not receiving any L1 framing from the endpoint or adjunct (Endpoint Idle), or it is communicating with the endpoint or adjunct but cannot transition to the Activated state (Endpoint Active).

The Deactivated state indicates a problem with the BRI-LINE circuit pack. When in this state, the Level 1 interface is idle and is not trying to communicate with the BRI endpoints or adjunct. When an ISDN-BRI port is placed in the out-of-service state, Level 1 is also put into the Deactivated state. This could be due either to the system detecting a fault with the port or to a **busyout port *PCSSpp*** request.

Table 221: Test #621 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
1187	ABORT	The board, port or station may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port and BRI-BD (board busied out). If this error type is present for BRI-PORT only, release the port via **release port *pp*** and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the board via **release port *PCSS*** and run the test again. **NOTE:** When you release a port, you release every port associated with it. If certain ports still need to be busied out, use the **port *PCSSpp*** to busy them out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to five times, reset the circuit pack via the **busyout board *PCSS*** and **reset board *PCSS*** commands. **2** If the test aborts again, replace the circuit pack.

Table 221: Test #621 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
1	FAIL	Received a status of Level 1 Pending Activation-Endpoint Idle which indicates a problem with the BRI endpoint or ASAI or Avaya adjunct, the wiring to the endpoint or adjunct, or the ISDN-BRI port. The TN2198, received a status of Level 1 Pending Activation. interface down, which indicates a problem with a connection between the switch and the NT1. **NOTE:** An NT1 is a 2- to 4-wire converter that is used to connect 4-wire Avaya terminals to a 2-wire TN2198 circuit pack. The NT1 also has status lamps to determine the health of the unit. **1** For the TN556, verify that an endpoint is connected to the port. If an endpoint is connected to the port then proceed to step 2. For the TN2198 verify that the connections are good between the switch and the NT1. Verify that the NT1 has power. **2** As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. If a TN2198 is used the set must have been plugged in for at least 15 seconds before it will stabilize. Execute the **test port *PCSSpp*** command, and review the results of the Level 1 Status Inquiry test to verify the repair. If this test is still failing, proceed to step 3. **3** For BRI endpoints, replace the BRI endpoint(s) connected to the port or the NT1 if a TN2198 is used. For ASAI or Avaya adjuncts, follow the recommended repair procedures of the manufacturer for link communication problems. For the NT1, follow the manufacturers repair procedures. Then execute the **test port *PCSSpp*** command and review the results of the Level 1 Status Inquiry test to verify repair. If this test is still failing, proceed to step 4. **4** Escalate the problem to the next tier.

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Table 221: Test #621 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
2	FAIL	For the TN556 or TN2208, received a status of Level 1 Pending Activation-Endpoint Active which indicates a problem with the BRI endpoint or ASAI or Avaya adjunct, the wiring to the endpoint or adjunct, or the ISDN-BRI port. For the TN2198, received a status of Level 1 Pending Activation. U interface up S/T interface down, which indicates a problem with the NT1 or the wiring between the NT1 and the BRI endpoint (S/T interface). **1** As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. Execute the **test port *PCSSpp*** command, and review the results of the Level 1 Status Inquiry test to verify the repair. If this test is still failing, proceed to step 2. **2** For BRI endpoints, try replacing the BRI endpoint(s) connected to the port. For ASAI or Avaya adjuncts, follow the recommended repair procedures of the manufacturer for link communication problems. For the NT1, follow the recommended repair procedures of the manufacturer. Then execute the **test port *PCSSpp*** command, and review the results of the Level 1 Status Inquiry test to verify repair. If this test is still failing, proceed to step 3. **3** Escalate the problem to the next tier.
3	FAIL	Received a status of Level 1 Deactivated; the port is out-of-service. **1** Issue the **status bri-port *PCSSpp*** command to verify that the service state of the port is out-of-service. If the service state of the port is not out-of-service, escalate the problem to the next tier. Otherwise, proceed to step 2. **2** If the port has been placed out-of-service via the **busyout port *PCSSpp*** command, try releasing the port by executing the **release port *PCSSpp*** command. Then issue the **test port long *PCSSpp*** command, and review the results of Level 1 Status Inquiry test. If this test is still failing, proceed to step 3. **3** After executing the **test port long *PCSSpp*** command, review the results of every test. Follow the repair procedures for any tests that fail. Verify repair of the problem by executing the **test port *PCSSpp*** command and by determining that the Level 1 Status test passes. If the test continues to fail for this reason, proceed to step 4. **4** Escalate the problem to the next tier.

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Table 221: Test #621 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
4	FAIL	For the TN2198 only: Received a status of Level 1 Pending Activation, the NT1 has a loss of power indicating a problem with the NT1. **1** For the NT1 follow the manufacturers recommended repair procedures. **2** Execute the **test port *PCSSpp*** command, and review the results of the Level 1 Status Inquiry test to verify the repair. If the test is still failing proceed to step 3. **3** Escalate the problem to the next tier.
	PASS	This test indicates that Level 1 is activated, or that software has taken the port out of service.

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Electronic Power Feed Inquiry (#622)

This test queries the BRI-LINE circuit pack for the status of the Electronic Power Feed (EPF) supplied to a BRI endpoint or an ASAI or Avaya adjunct. If the EPF is on and no overcurrent condition exists, this test passes. All other states are not normal and indicate a problem with the endpoint or adjunct, the wiring to the endpoint or adjunct, or the BRI-LINE circuit pack. This test is not run on the TN2208 circuit pack or the TN2198 and will always return a pass for the TN2198. The TN2208 has no power feeds.

Table 222: Test #622 Electronic Power Feed Inquiry

Error Code	Test Result	Description / Recommendation
1005	ABORT	This test is not valid for this port type. Ports on the TN2208 cannot run this test because this board does not have an electronic power feed.
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to five times, reset the circuit pack via the **busyout board *PCSS*** and **reset board *PCSS*** commands. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

1 of 2

Table 222: Test #622 Electronic Power Feed Inquiry

Error Code	Test Result	Description / Recommendation
1	FAIL	The BRI-LINE circuit pack reports that it has detected an overcurrent condition and has turned off the EPF. **1** As necessary, check and repair the wiring between the circuit pack and the endpoint or adjunct. Check the endpoints and replace one or both sets if the sets are drawing too much current. Execute **test port *PCSSpp*** and review the results of the EPF Inquiry test to verify the repair. If this test is still failing, proceed to step 2. **2** Execute **test port *PCSSpp***, and review the results of the Level 1 Status Inquiry test. If this test is also failing, then follow the repair procedure for the Level 1 Status Inquiry test. Otherwise, escalate this problem to the next tier.
	PASS	The Electronic Power Feed Inquiry test reports that the EPF is on.

2 of 2

Layer 1 Transmission Error Counter Test (#624)

This test reads and clears the BRI port's Layer 1 Transmission error counter maintained on the BRI-LINE circuit pack. This counter is incremented by the circuit pack when it detects a Layer 1 transmission problem. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is not zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error is most likely due to a problem with the wiring or the endpoint or adjunct (verify that the wiring meets the configuration rules defined in *DEFINITY® Communications System Generic 1 and Generic 3i Wiring, 555-204-111*. It does not indicate a problem with the ISDN-BRI circuit pack. This test is useful for verifying the repair of the problem.

Table 223: Test #624 Layer 1 Transmission Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to five times, reset the circuit pack via **busyout board *PCSS*** and **reset board *PCSS***. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.

1 of 2

Table 223: Test #624 Layer 1 Transmission Error Counter Test

Error Code	Test Result	Description / Recommendation
value	FAIL	The BRI-LINE circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, review the results of other tests in the long test sequence. Pay particular attention to the results of the Level 1 Status Inquiry test. Follow repair procedures for any of the executed tests if they fail. Otherwise, go to the next step. **3** If the tests for the endpoints or adjunct pass and the Layer 1 Transmission Error Counter test continues to fail, check the wiring to the endpoints or adjunct. If the wiring appears to be fine, escalate the problem.
	PASS	The Layer 1 Transmission error counter was read correctly and has a value of 0.

2 of 2

Receive FIFO Overflow Error Counter Test (#625)

This test reads and clears the BRI port's Receive FIFO Overflow error counter maintained on the BRI-LINE circuit pack. This counter is incremented by the circuit pack when it detects an overflow of its receive buffers. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is non-zero, the test fails, and the value of the counter is displayed in the Error Code field.

This error can occur if signaling frames are being received from the packet bus at a rate sufficient to overflow the receive buffers on the circuit pack for a port OR if a hardware fault is causing the receive buffers not to be emptied properly by the circuit pack. This test is useful for verifying the repair of the problem.

Table 224: Test #625 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to five times, reset the circuit pack via the **busyout board *PCSS*** and **reset board *PCSS*** commands. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.

1 of 2

Table 224: Test #625 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
value	FAIL	The BRI-LINE circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, run the long test sequence, and pay particular attention to the Loop Around tests (#618 and #619). See the repair procedures for the executed test if it fails. Otherwise, go to the next step. **3** Replace the circuit pack.
	PASS	The Receive FIFO Overflow error counter was read correctly and has a value of 0.

2 of 2

Clear Error Counters Test (#270)

This test is not an actual test in the strict sense of the word. There are various error counters associated with each BRI-PORT/ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT. This test clears those counters and triggers the auditing of Terminal Endpoint Identifier (TEI) values and layer-3 reinitialization. This test is used only to send messages to the BRI-PORT/ABRI-PORT/ATT-PORT/LGATE-PT/ATTE-PT and, therefore, should neither abort nor fail.

Table 225: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
	PASS	The message to clear the error counters of the BRI-Port/ABRI-Port/ ATT-PORT/LGATE-PT/ATTE-PT has been sent.

BRI-SET, BRI-DAT, Various Adjuncts

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
BRI-SET	WARNING[2]	**test station *extension* l**	ISDN-BRI Set
BRI-DAT	WARNING[2]	**test data-module *extension*** l	ISDN-BRI Data Module
ASAI-ADJ	MAJOR[2]	**test station *extension*** **test data-module *extension***	ASAI-Adjunct
ASAI-ADJ	WARNING[3]	**test data-module *extension***	ASAI-Adjunct
ATT-ADJ	MAJOR[2]	**test station *extension***	Avaya-Adjunct
ATT-ADJ	WARNING[3]	**test station *extension***	Avaya-Adjunct
LGATE-AJ	MAJOR[2]	**test station *extension***	Ethernet ASAI-Adjunct
LGATE-AJ	WARNING[3]	**test station *extension***	Ethernet ASAI-Adjunct
ATTE-AJ	MAJOR[2]	**test station *extension***	Ethernet Avaya-Adjunct
ATTE-AJ	WARNING[3]	**test station *extension***	Ethernet Avaya-Adjunct

1 ***extension*** is the extension number of the station.

2 The alarm level for ASAI and Avaya adjuncts may be administered using the **set options** command. The alarm level can be set independently for on- and off-board alarms to WARNING, MINOR, or MAJOR for every ASAI and Avaya adjunct in the system.

3 Alarming for an ASAI and Avaya adjuncts is disabled if the adjunct asks the switch to suspend maintenance. When this occurs, an error and a WARNING alarm are logged against the endpoint. Busying out and releasing the ASAI station or ADJLK station will clear the alarm.

WARNING:

Information for isolating and resolving packet-bus faults is included in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. The flowchart Figure 15, Troubleshooting Packet Bus Problems, along with the other information presented in the chapter, can help resolve problems that involve more than a single station or circuit pack. See also Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)*.

WARNING:

If a significant packet-bus failure occurs, errors and alarms may not be logged as expected for BRI-PORT/ABRI-POR/ATT-PORT/ LGATE-PT/ ATTE-PT. Conditions under which this occurs are detailed in the Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)*.

The TN2208 ESAI MFB provides the system with an Ethernet interface to Adjunct-Switch Application Interface (ASAI) and Avaya adjuncts (for example, CONVERSANT® Voice System). This circuit pack contains 8 ports of line circuit interface, each of which operates with two B channels (referred to as B1 and B2 throughout this section) and one D channel. In this context, the term ''ISDN-BRI port" is used to refer collectively to ports on the TN2208 MFB circuit pack that is connected to ASAI or Avaya adjuncts.

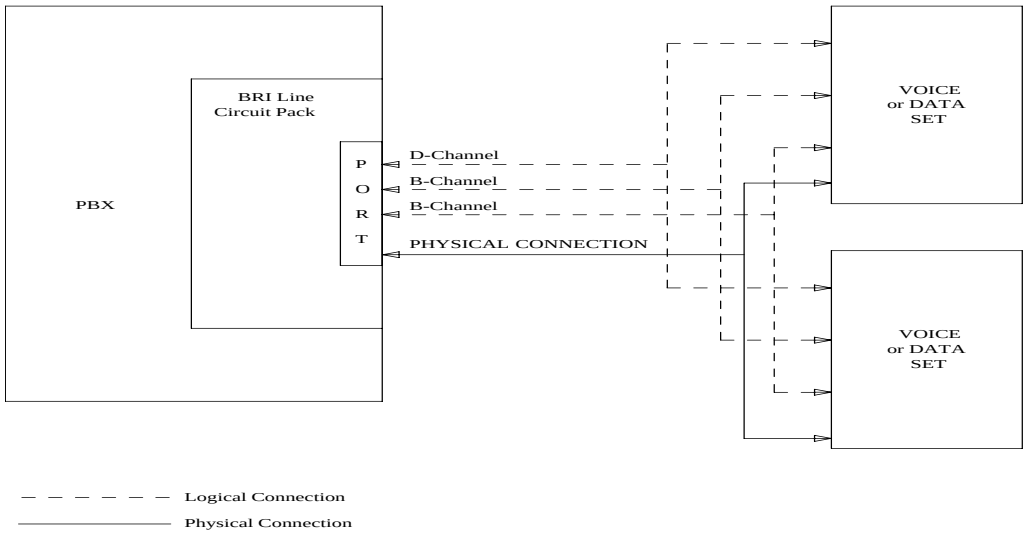
The TN2208 ESAI MFB is handled by switch software as it is an ISDN BRI compatible board and every maintenance action referring to ASAI and Avaya Adjunct Links in this section applies.

In G3iV1.1-286 and G3iV2-386, two types of ISDN-BRI endpoints may be connected to ISDN-BRI (ISDN Basic Rate Interface Line) TN556 and TN2198 circuit packs: ISDN-BRI station endpoints, ASAI (Adjunct-Switch Application Interface) and Avaya adjuncts (for example CONVERSANT® Voice System). These circuit packs contain 12 ports of line circuit interfaces, each of which operates at 192 kilobits per second (kbps) with two B channels and one D channel. For BRI endpoints, each B channel may support voice or circuit-switched data and may be circuit-switched simultaneously. The B channels are not used by ASAI or Avaya adjuncts. The D channel is used for conveying signaling between the switch and a BRI endpoint(s) or ASAI or Avaya adjuncts. Each ISDN-BRI D channel is connected to the switch processor and the ISDN-BRI port through the PKT-BUS (packet bus).

ISDN-BRI endpoints come in a number of configurations. Every endpoint requires the D channel to convey signaling information to the switch. A voice-only set requires only one B channel. A voice and data-capable set requires both B channels (one for voice and one for data). Therefore, each TN556 port can support either two voice-only sets or one voice and data-capable set. Only a single ASAI or Avaya adjunct may be connected to an ISDN-BRI port. Multiple adjuncts per line are not supported.

Figure 35, ISDN-BRI Set Interactions, on page 521 illustrates the physical connection (solid line) between an ISDN-BRI circuit pack and a voice or voice/data set. Each physical connection allows for two B channels, as stated above, plus one D channel. Each ISDN-BRI circuit pack can support up to 12 of these PHYSICAL connections to different voice and voice/data sets or ASAI and Avaya adjuncts.

Figure 35: ISDN-BRI Set Interactions



This section contains the ISDN-BRI Set, ASAI Adjunct and Avaya Adjunct Maintenance documentation. Some of the results of maintenance testing of the ISDN-BRI Set or the ASAI and Avaya Adjunct may be affected by the health of the ISDN-BRI circuit pack and port. These interactions should be kept in mind when investigating the cause of ISDN-BRI Set problems.

Hardware Error Log Entries and Test to Clear Values

Table 226: BRI-SET/ASAI-ADJ Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level BRI-SET BRI-DAT	Alarm Level ASAI-ADJ ATT-ADJ ATTE-AJ LGATE-AJ	On/ Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	Any	**test station** *ext* **r 2** **test data-module** *ext* **r 2**
2(a)	2-102	None				
18	0	**busyout station** *ext*	WARNING	MAJOR/ WARNING[2]	OFF	**release station** *ext*
130(b)			WARNING		ON	**test port** *PCSS* **sh**
257(c)	Any	BRI Layer 3 Query (#629)	WARNING	MAJOR/ WARNING[2]	OFF	**test station** *ext* **r 2** **test data-module** *ext* **r 2**
351(d)	0	None		WARNING	OFF	**busyout and release station**
513(e)	0	None				
769(f)	0	None	WARNING	MAJOR	OFF	
2561(g)	0	None				
2562-2566 (h)	0	None				
2567(o)	0	None				
2568 (p)	0	None				
2817(i)	0	XID test (#628)	WARNING	MAJOR/ WARNING[2]	OFF	**test station** *ext* **r 2** **test data-module** *ext* **r 2**
3073(j)	0	BRI Remote Loop Back (#627)	WARNING		OFF	**test station** *ext* **l r 2** **test data-module** *ext* **l r 2**
3329 (k)	Any	Signaling Link Status (#626)	WARNING	MAJOR/ WARNING[2]	OFF	
3584	0,1	None				
3585-3839 (l)	0	None				
3840-4095 (m) (n)	0	None				

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major and Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the set options command.

Notes:

a Errors of this type indicate violations of the ISDN-BRI signaling protocol; timers associated with certain layer-3 messages have expired before a required response was received. In the following table, the aux data field indicates what timer has just expired.

Aux Data	Timer Type
2	First T303 (SETUP timer)
3	Second T303 (SETUP timer)
4	T305 (DISConnect timer)
5	First T308 (RELease timer)
6	Second T308 (RELease timer)
10	T316 (RESTart timer)
12	T309 (Layer-2 Failure timer)
16	TM100 (Management Information message Timer 1)
17	TM200 (Management Information message Timer 2)
102	TASAI (ASAI Routing timer)

The switch sent a message to the endpoint that did not respond in the allotted time. This can happen occasionally due to failure of the point-to-point signaling link or because of a problem in the BRI endpoint or ASAI adjunct or Avaya adjunct. Execute **test station *extension* sh** and pay particular attention to the results of the BRI Layer 3 Query test (#629). If this test fails, follow the repair procedure for Test #629.

b This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

c This error occurs when the endpoint does not respond to the service state query message sent to the adjunct or the endpoint. This error causes an alarm to be raised. The alarm is retired when the switch receives a response to the service state query to the endpoint or the adjunct.

For BRI endpoints, the Aux Data field for this error contains "0." When it occurs, execute **test station *extension* sh** and pay particular attention to the results of the BRI Layer 3 Query test (#629). If this test fails, follow the repair procedure for Test #629.

When this error occurs for an ASAI or Avaya adjunct, the Aux Data field indicates the state of the ASAI link or Avaya link and whether an invalid response or no response was received to the query from the switch, as shown in the following table:

Aux Data	ASAI Link State	Error
102	13-restarting	No response to RESTART message
104	13-restarting	Invalid response to RESTART message
152	13-restarted	No response to layer-3 query
154	13-restarted	Invalid response to layer-3 query
202	13-established	No response to layer-3 query
204	13-established	Invalid response to layer-3 query

See **status bri-port** in Chapter 1, "Maintenance SAT Commands" in Maintenance Commands Reference (555-245-101) for an explanation of the ASAI link states.

For ASAI or Avaya adjuncts, the switch automatically queries the adjunct every two minutes (and therefore the Layer 3 Query test is not executed for ASAI or Avaya adjuncts via a command issued from the G3MT terminal). While alarmed for this error, the switch momentarily (for five seconds) takes the associated port out-of-service every 15 minutes. This action is taken in an attempt to stimulate recovery actions to be taken by the adjunct.

When this error occurs for an ASAI or Avaya adjunct, the service technician should:

1. Execute **test station *extension*** and pay particular attention to tests that fail. Perform the associated repair procedures for those tests.
2. Check the health of the adjunct by following the recommended repair procedures of the manufacturer of the adjunct if the preceding step does not resolve the problem.
3. If the above steps do not resolve the problem and the alarm persists, follow normal escalation procedures.

d This error and associated WARNING alarm are logged against an ASAI or Avaya endpoint when the adjunct has asked the switch to suspend Maintenance on the ASAI or Avaya endpoint. Busy out and release the ASAI station or ADJLK station to clear the alarm.

e This error occurs when the endpoint sends more messages than the switch can handle. The switch suspends the reception of messages from the endpoint for a short period of time. There is no repair procedure for this error. If the condition persists, replace the endpoint.

f This error occurs when a BRI endpoint's signaling-associated link has too much traffic related to link establishment. This could occur if the signaling link is bouncing between assigned and established states. Software suspends activity to this endpoint for 75 minutes when the endpoint is alarmed due to this problem. Note that service suspension does not occur if the endpoint is an ASAI or Avaya adjunct. If this problem persists, replace the endpoint. If replacing the endpoint does not fix the problem, follow normal escalation procedures.

g This error occurs when the ASAI-ADJ or ATT-ADJ or LGATE-AJ or ATTE-AJ message is not transmitted because the PKT-CTRL (Packet Control circuit pack) transmit buffers are exhausted. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the PKT-CTRL, the signaling link, or the ASAI or Avaya adjunct. Attempt to resolve the problem by following the repair procedures for the PKT-CTRL. If these attempts fail, the problem should be escalated because re-engineering of the traffic on the PKT-CTRL, signaling link, or adjunct may be necessary.

h This error occurs when the ASAI message is not transmitted because the transmit buffer for the ASAI link is full, causing the link to be flow controlled. Frequent or persistent occurrence of these events may indicate a hardware problem or traffic overload on the PKT-CTRL, the signaling link, or the ASAI or Avaya adjunct. Attempt to resolve the problem by following the repair procedures issued by the manufacturer of the adjunct. If these attempts fail, the problem should be escalated because re-engineering of the traffic on the PKT-CTRL, signaling link, or adjunct may be necessary.

i This error indicates a layer-2 problem over the D channel between the switch and the endpoint. When this error occurs, an alarm is raised against the station or adjunct. Execute **test station *extension* short** and pay particular attention to the results of the BRI XID test (#628). If this test fails, follow the repair procedure for Test #628.

j This error indicates a problem with the B-channel connection between the switch and the endpoint. When this error occurs, a warning alarm is raised against the endpoint. Execute **test station *extension* long** and pay particular attention to the results of the BRI Remote Loop Back test (#627). If this test fails, follow the repair procedure for Test #627.

k This error occurs whenever the point-to-point signaling link to the endpoint goes down (except when it goes down because either the PKT-CTRL or the PKT-BUS has failed or has been busied out by system technician). When this error occurs, an alarm is raised against the endpoint or adjunct. Execute **test station *extension* short** and pay particular attention to the results of the Signaling Link Status test (#626). If this test fails, follow the repair procedure for Test #626. The alarm is retired when the signaling link is reestablished to the endpoint or adjunct.

l Certain ASAI protocol-specific cause codes are logged by switch software. The cause code can be determined from the following formula:

If the error type is greater than 3712, then the ASAI cause code is equal to the error type minus 3712. This code was sent to the adjunct by the switch.

If the error type is less than 3712, then the ASAI cause code is equal to the error type minus 3584. This code was sent to the switch by the adjunct.

A description of the various ASAI cause values is contained in the Table 227, ASAI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes), on page 525. This table also contains recommended system technician actions associated with the cause value. In addition, the Aux Data field of the Error Log entry contains additional diagnostic information additional diagnostic.

Table 227: ASAI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes)

Error Code	Test Result	Description / Recommendation
0	Unrecognized ASAI Protocol Operation	Requested ASAI protocol operation is not implemented by the switch or adjunct. Aux Data field of Error Log entry contains protocol identifier for unrecognized operation. **1** Consult switch and adjunct documentation to determine which set of operations is supported by the switch and the adjunct. Adjunct administration turning off operations not implemented by the switch may resolve the problem. **2** If step 1 does not resolve the problem, escalate to the next tier.
40	Resources not available	No available internal resources to service switch or adjunct request. System transaction capacity for adjunct or switch is exceeded. **1** Re-engineering of adjunct services my be required. If problem persists, escalate problem to the next tier.

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Table 227: ASAI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes)

Error Code	Test Result	Description / Recommendation
63	SERVICE OR OPTION NOT AVAILABLE	Requested ASAI capability or resource is not available on the switch or adjunct. More than one adjunct may be contending for the same switch resources. Potential administration mismatch between the resource domains administered on the switch and those administered on the adjunct. **1** Verify that no overlapping administration of switch resources (e.g., requesting notifications on a single domain by multiple adjuncts or multiple adjuncts attempting to control a single call) exists across any adjunct connected to the switch. If an overlap exists, then re-administer the adjuncts to guarantee that each adjunct is associated with a unique set of switch resources. **2** If step 1 does not resolve the problem, escalate to the next tier.
79	SERVICE OR OPTION NOT IMPLEMENTED	Requested service or option (or combination of selected options) is not supported (implemented) in switch or the adjunct. **1** Consult switch and adjunct documentation to determine ASAI service and options supported by both switch and adjunct. Re-administration of the switch-administered capabilities (see Customer Optional Feature screen) or those of the adjunct may be necessary to correct the problem. **2** If step 1 does not provide the set of desired services due to deficient implementation, escalate the problem to the next tier.
87	Internal switch audit	There is an inconsistency in switch data records. **1** There is no action needed since the switch has corrected the data inconsistency. **2** If a number of these errors continue to occur, then escalate to next tier.

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m Certain ISDN-BRI cause codes are logged by switch software. The cause code can be determined from the following formula:

If the error type is greater than 3968, then the ISDN-BRI cause code is equal to the error type minus 3968. This code was sent to the endpoint by the switch.

If the error type is less than 3968, then the ISDN-BRI cause code is equal to the error type minus 3840. This code was sent to the switch by the endpoint.

A description of the various ISDN-BRI cause values is contained in Table 228, ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes), on page 527. This table also contains recommended system technician actions associated with the cause value. In addition, the Aux Data field of the Error Log entry contains additional diagnostic information.

n Error 3847 indicates that sets on the port do not support level 3 initialization. Consult the Set Service documentation

o For the Error 2567 indicates that the version of ASAI is not supported, check version of the software running on the ASAI or Avaya adjunct.

Table 228: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes)

Error Code	Test Result	Description / Recommendation
1	Channel in use	Another station is using requested channel on the BRI-PORT. (Not applicable for ASAI or Avaya adjuncts.) For BRI endpoints: **1** Try to originate a call to or from this port. **2** If the error persists, busyout and release the port. **3** If the problem still persists, replace stations on the port. **4** If the problem still persists, escalate to the next tier.
34	No circuit or channel available	A resource on the switch is unavailable for a call. For BRI endpoints: This cause value is not logged. For ASAI or Avaya Adjuncts: This condition means that there are no available trunks for an outgoing call request. **1** Verify that the adjunct is administered to support the trunk capabilities of the switch. **2** Investigate trunk group status by issuing **status trunk** commands from the SAT or by requesting a trunk group query or queries from the adjunct. **3** Perform trunk diagnostic procedures outlined in this manual. **4** If step 3 does not resolve the problem, escalate to the next tier.
42	Switch Equipment Congestion	Switch takes control to limit received traffic. For BRI endpoints: This cause value is not logged. For ASAI or Avaya Adjuncts: **1** Refer to the CallVisor protocol reference manual. **2** If step 1 does not resolve the problem, escalate to the next tier.

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Table 228: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes)

Error Code	Test Result	Description / Recommendation
50	Requested Facility Not Subscribed	Requested facility is implemented, but not administered. Potential administration problem with endpoint or adjunct. For BRI endpoints: **1** Verify the switch administration of endpoint using **display station** or **display data-module**. **2** If step 1 does not resolve the problem, refer to the endpoint's service manual and verify administration on the endpoint. **3** If step 2 does not resolve the problem, escalate to the next tier. For ASAI adjuncts: **1** Display the Customer Optional Features screen (administration screen) on the switch to determine which ASAI capabilities are turned on in the switch. **2** Verify that the adjunct is administered to support the identical capabilities as the switch. If there is a mismatch in the administered capabilities, then re-administer the switch and/or the adjunct to establish a consistent set of desired capabilities on both the switch and the adjunct. **3** If step 2 does not resolve the problem, escalate to the next tier. For Avaya adjuncts: **1** Display the Customer Optional Features screen (administration screen) on the switch to determine whether the Avaya adjunct is set enabled on in the switch. **2** If error type 2567 or 2568, verify the Avaya adjunct version, and re-administer if needed. **3** If step 2 does not fix the problem, escalate to the next tier of support
58	Bearer Capability Not Currently Available	Requested bearer capability is implemented, but not administered. No B channel is administered. See recommendation for Error Code 50 above.

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Table 228: ISDN-BRI CAUSE VALUES; (BRI-SET/ASAI-ADJ Error Log Entries Notes)

Error Code	Test Result	Description / Recommendation
65	Bearer Service Not Implemented	Requested service not implemented in switch or endpoint.
69	Requested Facility Not Implemented	Requested service not supported in switch or endpoint. **1** Consult switch and endpoint documentation to determine service support. **2** If step 1 does not resolve the problem, escalate to the next tier.
81	Invalid CRV	An invalid CRV was sent by the adjunct. **1** This may indicate a CRV inconsistency between the switch and the adjunct. Refer to the CallVisor protocol reference manual. **2** If step 1 does not resolve the problem, escalate to the next tier.

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p For Error 2568 indicates that the adjunct id is invalid, check the vender id or software running on the Avaya adjunct.

System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system and deciding which ones to address, always investigate errors associated with the circuit pack and port first. Clearing these error codes first may also clear errors generated against the endpoint. When every circuit pack and port error has been cleared, and errors still exist against the endpoint, always investigate errors in the order they are presented in the table below. For example, by clearing error codes associated with the *Signaling Link Status* test (#626), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link Status test (#626)	X	X	ND
BRI XID test (#628)	X	X	ND
BRI Layer 3 Query (#629)	X(a)	X(a)	ND
BRI Remote Loop Back (#627)		X(a)	ND
BRI Set Audits (#630)	X(a)	X(a)	ND
BRI Vendor ID test (#631)		X(a)	ND
BRI Model/Vintage ID test (#632)		X(a)	ND

1 D = Destructive; ND = Nondestructive

NOTE:
(a) Execute the **test port long *PCSSpp*** command, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.

Signaling Link Status Test (#626)

This test determines the current status of the signaling link. This test passes if the link is "bound" to an endpoint and fails if the link is "not bound."

The definition of the term "bound" for a link depends upon the type of endpoint and may depend on the successful completion of procedures at both Layers 2 and 3 of the protocol. The definition of "bound" for each type of endpoint is as follows:

- **BRI endpoints administered for MIM (management information messages) initialization (multipoint):**

  NOTE:
  An MIM is a level 3 message that conveys management and maintenance information between a communications system and a BRI terminal.

  For endpoints of this type, the signaling link is "bound" when the link is connected at Layer 2 and the link has been associated with an endpoint, [that is, the endpoint has completed SPID initialization (L3 established)].

- **ASAI adjuncts and BRI endpoints not administered for MIM initialization (point-to-point):**

  For endpoints of this type, the signaling link is "bound" when the link is connected at Layer 2 (L2 established).

For every endpoint type, a signaling link becomes "unbound" when it is disconnected at Layer 2. For BRI endpoints supporting MIM initialization, a signaling link may also become "unbound" if a subsequent attempt to perform SPID initialization on a "bound" link fails (that is, wrong SPID is entered into the endpoint by the user).

Table 229: Test #626 Signaling Link Status Test *1 of 2*

Error Code	Test Result	Description / Recommendation
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, use **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. **2** If step 1 does not resolve the problem, escalate to the next tier.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus in the PPN. **2** After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. **c** If this error type is present for BRI-SET only, then release the station via **release station.** **d** If this error type is present for BRI-PORT and BRI-SET, then release the port via **release port *PCSSpp*** and run the test again. **e** If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via **release port *PCSSpp*** and run the test again. If the error is present for BRI-SET only, then release the circuit pack via **release port *PPCSS*** and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via **release board *PPCSS*** and run the test again. **NOTE:** When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, use **busyout port *PCSSpp*** to busy them out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.

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Table 229: Test #626 Signaling Link Status Test *2 of 2*

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1113	FAIL	The signaling link is not "bound" to the adjunct or endpoint. For BRI endpoints supporting MIM initialization, this error indicates that the endpoint has not been bound to a signaling link (that is, SPID initialization has not been completed). Since the signaling link associated with the endpoint is not identified until SPID initialization completes, this error does not imply that the signaling link is connected or disconnected at Layer 2 nor does it provide the status of TEI assignment for the endpoint. For ASAI adjuncts and BRI endpoints not supporting MIM initialization, this error indicates that the link is disconnected at Layer 2. Since the signaling link associated with the endpoint has been identified via administration, the link is only "unbound" from the endpoint when it is disconnected. **1** Execute **status bri-port *PCSSpp*** and see the associated procedures in BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port) on page 499.
	PASS	The signaling link is connected at Layer 2 and "bound" to the BRI endpoint or ASAI adjunct.

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BRI Remote Loop Back Test (#627)

This test checks the integrity of a circuit-switched B-channel connection between the switch and the endpoint.

In this test, the endpoint is put in the "maintenance busy" state to prevent the switch from issuing calls to the endpoint during the test. An application message containing a loop back activate request for the appropriate B channel is sent to the endpoint. The endpoint responds with a loop back activated response. Maintenance then sends data to the endpoint over the B channel under test. Since the B channel is looped back at the endpoint, maintenance should receive the data that it sent. If no data is detected, the test fails. An application message containing a loop-back deactivate request is then sent to the endpoint to discontinue the remote loop-back test. The endpoint responds with an MIM message containing a loop-back deactivate response. Maintenance then releases the endpoint so that it is available to terminate calls.

This test is not executed for ASAI adjuncts because adjuncts do not support MIMs upon which this test is based.

Table 230: Test #627 BRI Remote Loop Back *1 of 3*

Error Code	Test Result	Description / Recommendation
1000	ABORT	Could not seize the endpoint or B channels for test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1005	ABORT	The endpoint's MIMs Supported field is administered to "no." **1** Use **change station *extension*** to change parameter only if the endpoint documentation reflects support for ISDN-BRI Management and Maintenance Procedures.
1113	ABORT	The signaling link between the switch and the endpoint is down. **1** Use **test port *PCSSpp* long** to clear any errors that prevent establishment of the signaling link. **2** Examine the results of the Signaling Link Status test (#626) that is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. **3** If the XID test (#628) continues to abort, escalate the problem.
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. **2** If step 1 does not resolve the problem, escalate to the next tier.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus in the PPN. **2** After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 230: Test #627 BRI Remote Loop Back *2 of 3*

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. **f** If this error type is present for BRI-SET only, then release the station via the **release station** **g** If this error type is present for BRI-PORT and BRI-SET, then release the port via **release port *PCSSpp*** command and run the test again. **h** If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via the **release port *PCSSpp*** command and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via the **release board *PPCSS*** command and run the test again. If the error is present for BRI-SET only, then release the circuit pack via the **release port *PPCSS*** command and run the test again. **NOTE:** When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, use the **busyout port *PCSSpp*** command to busy them out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2068	ABORT	The endpoint has rejected the switch sent application message. This indicates that the endpoint does not support the ISDN-BRI Management and Maintenance Procedure for Loop Back testing. **1** Use the **change station *extension*** command and change the *MIMs Supported* field to **n**.
2069	ABORT	The endpoint has returned an error response to the application message sent by the switch.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 230: Test #627 BRI Remote Loop Back *3 of 3*

Error Code	Test Result	Description / Recommendation
S8100: 2000	FAIL	No loop back activation or deactivation response is received from the endpoint. **1** Consult the endpoint documentation to determine if ISDN-BRI Management and Maintenance Procedures are supported. If not supported, use **change station extension** command to change the `MIMs Supported?` field to **n**. Use the **busyout station extension** and **release station extension** commands to busyout and release the endpoint to resolve any endpoint alarms resulting from failure of this test. **2** If the endpoint supports these procedures and the test continues to fail, assume the endpoint is defective and replace it.
S8100: 2071	FAIL	No data is detected on Channel B1 during loop back.
S8100: 2072	FAIL	No data is detected on Channel B2 during loop back. **1** Replace the endpoint and repeat test. **2** If test continues to fail, check the wiring between the endpoint and the switch and repeat the test.
S8100:	PASS	The endpoint has responded to the switch activate and deactivate loop back application messages. Data has been detected on the looped back channels.

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BRI XID Test (#628)

This test checks the D-channel connection between the server and an endpoint or adjunct.

In this test, a D-channel XID frame is sent to the endpoint or adjunct over the point-to-point signaling link. The test passes if the endpoint or adjunct responds with a layer-2 XID-RESPONSE frame

This test must be administered to not run in the Station Administration screen for ports on a TN2208.

Table 231: Test #628 BRI XID *1 of 2*

Error Code	Test Result	Description / Recommendation
1000	ABORT	The BRI-SET, ASAI-ADJ, ATT-ADJ, LGATE-AJ, ATTE-AJ is busy. The test cannot be executed at this time: **1** Pause momentarily (30 seconds) and re-execute at this time. **2** If this problem persists, escalate this problem. **NOTE:** A BRI-PORT can also be busy. When using this for BRI-PORT/ABRI-PORT tests, the words "BRI-SET, ASAI-ADJ, ATT-ADJ," can be changed to "BRI-PORT, ABRI-PORT, ATT-ADJ."
1005	ABORT	The endpoint is not administered to support XID testing. **1** If the endpoint documentation reflects support XID testing, use **change station *extension*** and change the *XID Testing* field on the screen to **y**.
1113	ABORT	The signaling link between the switch and the endpoint is down. **1** Use **test port *PCSSpp* long** to clear any errors that prevent establishment of the signaling link. **2** Examine the results of the Signaling Link Status test (#626) that is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. **3** If the XID test (#628) continues to abort, escalate the problem.
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. **2** If step 1 does not resolve the problem, escalate to the next tier.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus in the PPN. **2** After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 231: Test #628 BRI XID *2 of 2*

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. **i** If this error type is present for BRI-SET only, use **release station** to release the station. **j** If this error type is present for BRI-PORT and BRI-SET, use **release port *PCSSpp*** and run the test again. **k** If the error is present for BRI-BD, BRI-PORT, and BRI-SET, use **release port *PCSSpp*** to release the circuit pack, and run the test again. If the error is present for BRI-SET only, use **release port *PCSSpp*** to release the circuit pack, and run the test again. If the error is present for both BRI-BD and BRI-PORT, use **release board *PPCSS*** to release the circuit pack, and run the test again. **NOTE:** When you release the circuit pack, you release every port associated with it. If ports still need to be busied out, use **busyout port *PCSSpp***. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2000	FAIL	The XID-RESPONSE message was not received from the endpoint. **1** Consult the endpoint's documentation to determine whether layer-2 XID and XID-RESPONSE messages are supported. If the documentation reflects no support for these messages, use **change station *extension*** and change the XID Testing field to **n**. **2** If the endpoint supports these layer-2 messages and the test continues to fail, assume the endpoint is defective and replace it. **3** If the test continues to fail, escalate the problem.
	PASS	The switch can successfully pass messages over the D channel to the BRI endpoint.

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BRI Layer 3 Query Test (#629)

This test is used to check the application layer communications between the switch and the endpoint or adjunct.

For BRI endpoints, an application message containing the appropriate endpoint service state is sent by the switch to the endpoint. The endpoint responds with an acknowledgment to the application message.

For ASAI and Avaya adjuncts, this test is not executed from the administration terminal. Rather, a query message is automatically sent by the switch every two minutes. Failure of the switch to receive a response to a query from the adjunct is logged in the Hardware Error Log.

Table 232: Test #629 BRI Layer 3 Query

Error Code	Test Result	Description / Recommendation
1005	ABORT	The endpoint's MIMs Supported? field is administered to "no." **1** Use **change station *extension*** to change the parameter only if the endpoint documentation reflects support for ISDN-BRI Management and Maintenance Procedures.
1113	ABORT	The signaling link between the switch and the endpoint or adjunct is down. **1** Use **test port *PCSSpp* long** to clear any errors that prevent establishment of the signaling link. **2** Examine the results of Test #626 that are executed with the command. If this test aborts or fails, follow the repair procedure for the Signaling Link Status test. **3** Escalate problem if BRI Layer 3 Query test continues to abort.
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Consult the repair procedure for PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. **2** If step 1 does not resolve the problem, escalate to the next tier.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus in the PPN. **2** After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.

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Table 232: Test #629 BRI Layer 3 Query

Error Code	Test Result	Description / Recommendation
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. **l** If this error type is present for BRI-SET only, then release the station via **release station**. **m** If this error type is present for BRI-PORT and BRI-SET, then release the port via **release port *PCSSpp*** and run the test again. **n** If the error is present for BRI-BD, BRI-PORT, and BRI-SET, then release the circuit pack via **release port *PCSSpp*** and run the test again. If the error is present for BRI-SET only, then release the circuit pack via **release port *PPCSS*** and run the test again. If the error is present for both BRI-BD and BRI-PORT, then release the circuit pack via **release board *PPCSS*** and run the test again. **NOTE:** When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, use **busyout port *PCSSpp*** to busy them out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2068	ABORT	The endpoint has rejected the switch sent application message. This indicates that the endpoint does not support the ISDN-BRI Management and Maintenance Procedure for Endpoint Service messages. **1** Use **change station *extension*** and change the MIMs Supported field to **n**.
2069	ABORT	The endpoint has returned an error response to the switch sent application message. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 232: Test #629 BRI Layer 3 Query

Error Code	Test Result	Description / Recommendation
2000	FAIL	No response is received from the endpoint or the adjunct. For BRI endpoints: **1** Consult the endpoint's documentation to determine whether ISDN-BRI Management and Maintenance Procedures are supported. If not supported, use **change station *extension*** to change the MIMs Supported field to **n**. Use **busyout station *extension*** and **release station *extension*** to busyout and release the endpoint to resolve any endpoint alarms resulting from failure of this test. **2** If the endpoint supports these procedures and the test continues to fail, assume the endpoint is defective and replace it.
	PASS	The endpoint has successfully responded to the switch's application message.

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BRI Set Audits Test (#630)

This is a series of two tests that are classified as audits. The switch sends messages to the BRI endpoint to perform the following tests:

- Ringer Audit – This audit insures that both the switch and the endpoint agree as to the current state of the endpoint's ringer.
- Lamps Audit – This audit insures that both the switch and the endpoint agree as to the current state of the endpoint's lamps.
- Call Activity Audit – This audit insures that the state of calls is consistent between the switch and the endpoint.

This test is not executed for ASAI or Avaya adjunct because adjuncts do not employ ringers or lamps, or establish calls on the B channels associated with the BRI interface.

Table 233: Test #630 BRI Set Audits

Error Code	Test Result	Description / Recommendation
1113	ABORT	The signaling link between the switch and the endpoint is down. **1** Use **test port *PCSSpp* long** to clear any errors that prevent establishment of the signaling link. **2** Examine the results of the Signaling Link Status test (#626) that is run as part of this command. If this test aborts or fails, follow the repair procedure for Test #626. **3** If the BRI Set Audits test continues to abort, escalate the problem.

1 of 3

Table 233: Test #630 BRI Set Audits

Error Code	Test Result	Description / Recommendation
1139	ABORT	The PN's packet bus is out-of-service. **1** Follow the repair procedures for the packet bus. **2** After completing step 1, execute **test port long *PCSSpp***, and review the results of the BRI Port Local LAN Loop Around test (#618) to verify the repair.
1141	ABORT	The PKT-CTRL is out-of-service. **1** Refer to PKT-CTRL (Packet Control Circuit Pack) Maintenance documentation. **2** If step 1 does not resolve the problem, escalate to the next tier.
S8100: 1144	ABORT	The PPN Packet Bus is out-of-service. **1** Follow the repair procedures for the Packet Bus in the PPN. **2** After completing Step 1, execute the **test port long PCSSpp** command, and review the results of the BRI Port Local LAN Loop Around Test to verify the repair.
1187	ABORT	The circuit pack, port or station may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (busied out) for BRI-BD, BRI-PORT, or BRI-SET. **o** If this error type is present for BRI-SET only, then release the station via **release station**. **p** If this error type is present for BRI-PORT and BRI-SET, then release the port via **release port *PCSSpp*** and run the test again. **q** If the error is present for BRI-BD, BRI-PORT, and BRI-SET, use **release port *PCSSpp*** to release the circuit pack, and run the test again. If the error is present for both BRI-BD and BRI-PORT, use **release board *PPCSS*** to release the circuit pack, and run the test again. **NOTE:** When you release the circuit pack, you release every port associated with it. Use **busyout port *PCSSpp*** if ports still need to be busied out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 233: Test #630 BRI Set Audits

Error Code	Test Result	Description / Recommendation
	PASS	The switch has successfully executed the BRI station audits.

3 of 3

SPID Facility Test

This test is used to verify the wiring and operation of the signaling link between the switch and a endpoint or adjunct on a BRI interface. **This test is not executed from the administration terminal, but rather is executed by using a BRI test set equipped with a display.** The test set may replace the BRI set, ASAI or Avaya adjunct under test by plugging it into the same jack or by bridging it onto the wiring at some point between the switch and the endpoint (or adjunct), thereby creating a pseudo-BRI multipoint configuration.

When plugged into the port in this manner, the test set establishes a signaling link connection with the switch and attempts to complete SPID initialization by using the Service SPID administered for the system (see the System Maintenance Administration screen). If the test set displays the correct administered port address for the endpoint or adjunct under test, the test passes (see Table 234, Service SPID Display, on page 543). If after one minute nothing is displayed on the test set, the test fails.

SPID Facility Test

Test Result	Description / Recommendation
FAIL	No response is received from the endpoint. **1** Check the physical wiring between the switch and the endpoint or adjunct. **2** If test continues to fail, escalate to the next tier.

SPID Facility Test

Test Result	Description / Recommendation
FAIL	Display does not match administered port address for the endpoint or adjunct. **1** Change station administration for endpoint or adjunct to match displayed port address. **2** If test continues to fail, escalate the problem.
PASS	Display matches administered port address for the endpoint or adjunct. For BRI endpoints: **1** Verify that the SPID values administered in the switch and the endpoint are consistent. **2** If the SPID values are correct, replace the endpoint. **3** If test continues to fail, escalate the problem. For ASAI adjuncts: **1** Verify that the TEI values administered in the switch and the adjunct are consistent. **2** If the TEI values are correct, consult the recommended repair procedures of the manufacturer for the adjunct. **3** If test continues to fail, escalate the problem.

The abbreviations used in (Service SPID Display) have the following meanings:

UU	Universal cabinet number (1 – 44 for PNs)
C	Carrier (A,B,C,...)
SS	Slot (01, 02,...)
pp	port (01 – 12)
ext	extension one and two (1 – 99999)
SPID	service order profile identifier

Table 234: Service SPID Display

Restricted Service starting display column		8		14		25		31
UUCSSpp	-	ext1	-	SPID111111	-	ext2	-	SPID222222
starting display column		8		14		25		31

1 of 2

Table 234: Service SPID Display

Restricted Service starting display column		8		14		25		31
UUCSSpp	*	ext1	*	SPID111111	-	ext2	-	SPID222222
Bound to Second Endpoint Translation starting display column		8		14		25		31
UUCSSpp	-	ext1	-	SPID111111	*	ext2	*	SPID222222

2 of 2

CAB-CALM (Customer alarm)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
CAB-CALM	None	**test customer-alarm *location***	Customer Alarm

1 For information on specifying a ***location***, see Command Syntax on page 179.

The MO CAB-CALM provides control of a relay contact between a pair of leads from the TN2312BP IPSI that can be wired to an external alarming device that is provided by the customer (CPAD). A contact closure is provided between the leads when the alarm exceeds the level specified in the `CPE Alarm Activation Level` field on the ***change system-parameters maintenance*** screen.

The MO CAB-CALM is not associated with any background or demand tests that are used to clear alarms. This MO becomes active when any other MO reaches a predetermined level (none, warning, minor, or major) and generates an alarm. Clear the MO that is generating the alarm to retire the contact closure across the CPAD relay contact.

If you think that there is a problem with the CPAD, you can test it by executing the **test customer-alarm** command that activates the device closing the relay on the TN2312BP IPSI for one minute. You can specify the repeat parameter to close the relay contact for a longer time. The number of repeats that you specify is the number of minutes the external device is activated.

System technician-demanded test: Descriptions and error codes

The **test customer-alarm *location*** (**short|long**) **r#** command causes the TN2312BP IPSI to:

- Close the CPAD relay contact for one minute
- Return to the state determined by the active alarm level specified by the `CPE Alarm Activation Level` field on the ***change system-parameters maintenance*** screen

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Customer Provided Alarming Device Test (#115)	X	X	ND

1 D = Destructive, ND = Nondestructive

Customer Provided Alarming Device Test (#115)

The CPAD test closes the relay that activates the CPAD for one minute. If more than one minute is necessary to verify the CPAD activation, you can change the **repeat** number on the **test customer-alarm *location*** command to close the relay for up to 99 minutes. For example, specifying **r99** repeats for 99 minutes.

Table 235: Test 115 Customer provided alarming device

Error Code	Test Result	Description / Recommendations
1000	ABORT	This is an internal system error. **1** Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. **1** Repeat the command at one-minute intervals 1 to 3 times.
	PASS	(When the command returns a PASS result, the relay contact remains closed for one minute after the command is executed.) The software successfully sent the request to the TN2312BP IPSI circuit pack to turn on the CPAD. You must inspect the CPAD to verify that it is operating. **1** If the CPAD is operating, but a customer complains that the CPAD did not indicate an actual system alarm: **a** Enter **display system-parameters maintenance** to check the administered alarm-activation level **b** Compare administered alarm level with the customer's specifications. If the administered alarm level does not match the customer's specifications, change the alarm level using the **change system-parameters maintenance** screen. **2** If Test 115 passes, but the CPAD is not being activated, check the CPAD connection to the TN2312BP IPSI circuit pack. **3** If the CPAD can be activated but not deactivated, enter **status cabinet** or **status health** command to verify that emergency transfer is not activated in the affected media gateway. Note that you can force emergency transfer to manual OFF using **set emergency-transfer <cabinet>** command. **4** If Emergency Transfer is OFF and the CPAD still cannot be deactivated: **a** Enter **display system-parameters maintenance** to check the administered CPAD alarm levels. **b** Enter **display alarms** to compare CPAD levels against those currently in the system.

CAB-EXFR (emergency transfer)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
CAB-EXFR	MINOR	**test environment *location* sh**	Emergnncy Transfer
CAB-EXFR	MAJOR	**test environment *location* l**	Emergancy Transfer

1 For information on specifying a ***location***, see Command Syntax on page 179.

The emergency transfer feature connects some central office trunks directly through to analog user stations when the system has a serious problem or experiences a total power failure.

Emergency transfer is activated by the TN2312BP IPSI when:

- The system is booting.
- The cabinet containing the TN2312BP IPSI board is in power failure.
- The TN2312BP IPSI has detected a loss of control connectivity for more than 70 seconds.
- The server has detected a serious problem in the cabinet.
- A request is made from a SAT command to set the state of emergency transfer.

Refer to Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 for further information.

On, off, and auto in emergency transfer

This is introduced to set the state of emergency transfer (**set emergency-xfr on | off | auto *location***), because a physical switch is not provided on the faceplate of the TN2312BP IPSI circuit pack to control the state of emergency transfer.

The TN2312BP IPSI supplies -48V DC voltage to an emergency transfer panel. This -48V supply keeps relays within the emergency transfer panel operating which, in turn, keep analog stations and CO trunks wired to ports (station and trunk respectively) on the system. When the TN2312BP IPSI is supplying -48V, the state of emergency transfer is off. When a problem is detected and the TN2312BP IPSI stops supplying -48V the state of emergency transfer is on. When the TN2312BP IPSI is in the auto state, it is usually supplying -48V to the emergency transfer panel, but automatically switches to the on state and stops supplying -48V if it detects a problem.

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
1 (a)	—	Emergency transfer query test (#1532)	MAJOR	On	**test environment *location***
2 (b)	—	Emergency transfer query test (#1532)	MAJOR	On	**test environment *location***
257 (c)	—	Emergency transfer query tesst (#1532)	WARNING	On	**test environment *location***

Error Notes:

(a) Error Type 1 – Manual on. Run **test environment *location*** and follow the repair steps for Test #1532.

For information on specifying a location, see Command Syntax on page 179.

(b) Error Type 2 – Firmware has activated emergency transfer. This error is not expected. Run **test environment *location*** and follow the repair steps for Test #1532.

(c) Error Type 257 – Manual off. Run **test environment *location*** and follow the repair steps for Test #1532.

System technician-demanded test: Descriptions and error codes

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Emergency transfer query test (#1532)	X	X	ND

1 D = Destructive, ND = Nondestructive

Emergency Transfer Query test (#1532)

There is only one test associated with the MO CAB-EXFR. The emergency transfer query test queries the maintenance module on the TN2312BP IPSI to determine if the emergency transfer is set in MANUAL-ON or MANUAL-OFF mode. If emergency transfer is set to MANUAL-ON, a major alarm is generated. If emergency transfer is set to MANUAL-OFF, a warning alarm is generated.

Table 236: Test 1532 Emergency transfer query

Error code	Test result	Description and recommendation
1000	ABORT	This is an internal system error. **1** Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. **1** Repeat the command at one-minute intervals 1 to 3 times.
1	FAIL	The emergency transfer is set to Manual-Off. **1** Use the **status cabinet *cab*** or **status health *cab*** command to display the status of the emergency transfer select switch: • "on" means that emergency transfer was manually activated by the **set emergency-transfer on** command. • "off" means that emergency transfer was manually deactivated by the **set emergency-transfer off** command. • "auto+" means that the system has a serious alarm that causes Communication Manager to activate emergency transfer. • "auto-" means that emergency transfer is not active and is not being controlled by the **set emergency transfer** command. **2** If "off", issue **set emergency auto *cab*** command to return control of emergency transfer to Communication Manager.
2	FAIL	The emergency transfer is set to Manual-On. **1** Use the **status cabine *cab*** or **status health *cab*** command to display the status of the emergency transfer select switch: • "on" means that emergency transfer was manually activated by the **set emergency-transfer on** command. • "off" means that emergency transfer was manually deactivated by the **set emergency-transfer on** command. • "auto+" means that the system has a serious alarm that causes Communication Manager to activate emergency transfer. • "auto-" means that emergency transfer is not active and is not being controlled by the **set emergency transfer** command. **2** If "on", issue the **set emergency transfer auto *cab*** command to return control of emergency transfer to Communication Manager.
16	FAIL	Embedded software (firmware) has activated emergency transfer. This is an internal error, since Communication Manager should have set the state to "Manual-on", "Manual-off", or "auto" at the time the TN2312BP was initiated. **1** Run **test maintenance *cab*** to see if communications with the TN2312BP are up. **2** Reset the TN2312BP circuit pack with the **reset ipserver** command.

1 of 2

Table 236: Test 1532 Emergency transfer query

Error code	Test result	Description and recommendation
	PASS	System software has control of Emergency Transfer within this cabinet. If Emergency Transfer is currently invoked (the emergency transfer LED is on), the cause could be a major alarm. **1** The following shows the error types that can cause Emergency Transfer. If any of these errors appear in the log, then see TONE-BD (Tone-Clock Circuit) on page 1902, and resolve these error types first: • Error Type 3848, Aux Data 0 • Error Type 2305, Aux Data 0 These errors indicate the loss of one or more clock signals from the reported TN2312BP circuit pack. **a** Examine the Hardware Error Log for errors reported against circuit packs in the same port network, especially TDM-CLK, TONE-BD, and EXP-INTF. Follow the repair or replacement procedures indicated for any such errors found. **b** If the error is not corrected by resolving errors found in step 1, the TN2312BP circuit pack should be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911. **2** If none of the previous errors appear in the log, then check the Emergency Transfer hardware.
		2 of 2

CAB-MTCE (Media Gateway Maintenance)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run	Full name of MO
CAB-MTCE	MINOR	**test maintenance *location*[1] sh**	Media Gateway Maintenance
CAB-MTCE	MAJOR	**test maintenance *location* l**	Media Gateway Maintenance

1 For information on specifying a ***location***, see Command Syntax on page 179.

Avaya Communication Manager 2.0 introduces the G650 media gateway. The G650 media gateway does not support the traditional maintenance board (TN775D), therefore environmental maintenance is performed by the TN2312BP IPSI circuit pack. The CAB-MTCE MO is used to allow the alarming and logging of environmental maintenance errors for the TN2312BP IPSI in a G650 media gateway. Since the TN2312BP IPSI supports environmental maintenance in the G650 media gateway, trouble with the TN2312BP IPSI may cause environmental maintenance to falsely detect problems. The following environmental MOs may be affected:

- CAB-EXFR (emergency transfer) on page 547
- CAB-CALM (Customer alarm) on page 545
- CAB-PFL (Power Fan Lead) on page 556
- SER-BUS (Serial communication bus) on page 1598
- EXT-DEV (External device alarm) on page 966

When the TN2312BP is used in the SCC1 and MCC1 media gateways the collocated TN775D Maintenance circuit pack performs environmental maintenance.

When the TN2312BP IPSI is used in a G600 or CMC1 media gateway it monitors environment maintenance (power supply and fans) using the AuxSig lead.

Initialization

Initialization Test (#1548) is executed when an IPSI is inserted and the board and media gateway type is determined. When a TN2312AP is inserted in a CMC1, G600, or G650 the Power Fan Lead (AuxSig) environmental maintenance is enabled.

When a TN2312BP IPSI is inserted in either a CMC1 or G600, Communication Manager sends the following messages to the embedded software (firmware) on the board:

- Enable environmental maintenance (Power Fan lead)
- A query to verify that environmental maintenance is enabled

When a TN2312BP IPSI is inserted in a G650, Communication Manager sends the following messages to embedded software (firmware) on the board:

- Enable environmental maintenance
- Enable power supply insertion

- Enable power supply audits
- A query to verify that environmental maintenance is enabled
- A query to verify that power supply insertion is enabled
- A query to verify that power supply audits are enabled

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
1 (a)	—	Correct board test (#1546)	MINOR	ON	**test maintenance *location***
257 (b)	—	Sanity test (#1547)	MINOR	ON	**test maintenance *location***
513 (c)	Any	All	NONE	—	—
769 (d)	Any	All	NONE	—	—
1025 (e)	—	Reset test (#1545)	MINOR	ON	**test maintenance *location***
1281 (f)	—	Initialization test (#1548)	MINOR	ON	**reset maintenance *location***

Error Information

a **Error type 1**—When a TN2312AP IPSI is inserted into a CMC1 or G650 Media Gateway a minor alarm is raised. Full environmental maintenance is NOT available. Replace the TN2312AP IPSI with a TN2312BP IPSI. NOTE: A TN2312AP inserted in a G600 media gateway DOES not raise any alarm or error.

b **Error type 257**—This error indicates the inability to communicate with the TN2312BP IPSI board. NOTE: The board must be a TN2312BP IPSI for this test to run.

c **Error type 513**—This error indicates that the op-code for messages received from the TN2312BP was not equal to any known op-code. The unknown op-code is recorded under Aux data.

d **Error type 769**—This error indicates that a message with a valid op-code was received but some other part of the message was indecipherable. The op-code with the error is recorded under Aux data.

e **Error type 1025**—This error indicates that an unsuccessful attempt was made to reset environmental maintenance.

f **Error type 1281**—This error indicates that environmental initialization failed. Run the Reset Environmental Maintenance Test (#1545), which calls the Initialization Test (#1548).

System technician-demanded tests: Descriptions and error codes

Always investigate tests in the order presented in the following table when you inspect errors in the system. When you clear error codes associated with the Correct Board Test (1546), you might also clear errors generated from other tests in the testing sequence.

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Correct Board Test (#1546)	X	X	ND
Sanity Test (#1547)	X	X	ND
Reset Environmental Maintenance Test (#1545)	—	X	D

1 D = Destructive, ND = Nondestructive

Reset Environmental Maintenance test (#1545)

This test resets the environmental maintenance on the TN2312BP IPSI board.

Table 237: Test #1545 Reset test

Error code	Test result	Description and recommendation
1000	ABORT	There is an internal software problem. **1** Repeat the command at one-minute intervals 1 to 3 times.
1982	ABORT	The board being tested is NOT a TN2312BP IPSI or later. **1** Insert a TN2312BP IPSI circuit pack.
1986	ABORT	The TN2312BP IPSI failed to set emergency transfer to AUTO at initialization. **1** Run **reset maint** command.
2000	ABORT	The response to a query was not received in the time allowed. **1** Run **reset maint** command.
2500	ABORT	An internal operation failed (Possible unknown cabinet type). **1** Repeat the command at one-minute intervals 1 to 3 times.
1	FAIL	The TN2312BP IPSI environmental maintenance initialization failed. **1** Repeat the command at one-minute intervals 1 to 3 times.
2	FAIL	The TN2312BP IPSI failed a sanity test. **1** Run **reset maint** command. **2** If the problem persists, replace the circuit pack.

1 of 2

Table 237: Test #1545 Reset test

Error code	Test result	Description and recommendation
	PASS	Environmental maintenance has been enabled and passes a sanity test.
		2 of 2

Correct Board test (#1546)

The TN2312BP IPSI board is required for the environmental functions to work in the G650 media gateway. This test verifies that the proper IPSI is inserted in the G650.

Table 238: Test #1546 Correct board test

Error code	Test result	Description and recommendation
2500	ABORT	An internal operation failed. **1** Repeat the command at one-minute intervals 1 to 3 times.
1	FAIL	For G650 or CMC1 media gateways: A TN2312AP IPSI has been inserted.
	PASS	For G600 media gateways: Either a TN2312AP or TN2312BP IPSI is present.
	PASS	For CMC1, G600, and G650 media gateways: A TN2312BP IPSI is present.

Sanity test (#1547)

The TN2312BP is queried to determine whether or not it can sustain basic sanity.

Table 239: Test #1547 Sanity test

Error code	Test result	Description and recommendation
1000	ABORT	There is an internal system error. **1** Repeat the command at one-minute intervals 1 to 3 times.
1981	ABORT	The TN2312BP IPSI is busied out. **1** Issue the **release ipserver-interface** command.
1982	ABORT	The board being tested is NOT a TN2312BP IPSI or later. **1** Insert a TN2312BP IPSI circuit pack.
2033	ABORT	There is an internal system error.
2500	ABORT	An internal operation failed (Possible unknown cabinet type). **1** Repeat the command at one-minute intervals 1 to 3 times.
		1 of 2

Table 239: Test #1547 Sanity test

Error code	Test result	Description and recommendation
	PASS	The correct board is present and a valid response was received for a sanity query.
		2 of 2

CAB-PFL (Power Fan Lead)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
CAB-PFL	MINOR	**test environment *location***	Power Fan Lead
CAB-PFL	MAJOR	**test environment *location***	Power Fan Lead

1 For information on specifying a ***location***, see Command Syntax on page 179.

The CAB-PFL represents the state of a combined power/fan lead. This lead is known as the AuxSig lead. On a G650, the AuxSig output signal is a ground referenced relay contact closure indicating a failure of the 655A power supply outputs, hot spot thermal warning, hot spot thermal shutdown, or failure of the fan assembly in a G650.

Use the AuxSig lead to determine the alarm state of the power supplies and fans if the serial bus or the interface to the serial bus of the TN2312BP IPSI in a G650 fails. If there is a CAB-PFL alarm in a G650 carrier, there should also be a SER-BUS, POW-SUP, CAB-TEMP, or PS-RGEN alarm indicating the source of the failure.

Refer to Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 for further information.

When the TN2312BP IPSI is on a CMC1 or a G600 carrier, use the CAB-PFL MO to determine the status of the power supply and fans, but the repair procedure should be the same as that for RMC-ENV (Power/Fan Sensors) on page 1593.

NOTE:
Fan/filter replacement procedures for the CMC1 and G600 media gateways are to be found under Variable-speed fans in Chapter 7, Component Replacement in *Maintenance Procedures (555-245-103)*.

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level[1]	On/Off board	Test-to-clear value
1 (a)	—	Power/Fan lead query test (#1533)	MAJOR/ MINOR	OFF	**test environment *location***

1 The alarm level of CAB-PFL is adjusted to be the same as the highest active alarm level for SER-BUS, POW-SUP, CAB-TEMP, or PS-RGEN, or it will be a MAJOR alarm if no G650 alarms in that category are found.

Error Note:

a **Error type 1—**The AuxSig lead is active. Run **test environment *location*** and follow the repair steps for Test #1533.

System technician-demanded tests: Descriptions and error codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. When you clear error codes associated with the CAB-PFL (1533), you might also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short test sequence	Long test sequence	D/ND[1]
Power/Fan lead query test (1533)	X	X	ND

1 D = Destructive, ND = Nondestructive

Power/Fan lead query test #(1533)

The Power/Fan Query test sends a request for the state of the power/fan lead (AuxSig) to the TN2312BP IPSI board in the G650 with an A carrier address. If the lead is on, the test fails. If the lead is off, the test passes.

Table 240: Test 1533 Power/Fan lead query

Error code	Test result	Description and recommendation
1000	ABORT	This is an internal system error. **1** Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. **1** Repeat the command at one-minute intervals 1 to 3 times.
1	FAIL	**G650**: In a G650 carrier, this indicates a failure in any of the following MOs: • SER-BUS • POW-SUP • CAB-TEMP • PS-RGEN Use the diagnostic procedures for those MOs to clear the problem.

1 of 3

Table 240: Test 1533 Power/Fan lead query

Error code	Test result	Description and recommendation
1	FAIL (Cont)	**G600** / **CMC1** only: In a G600 or CMC1, this error code indicates a failure in either: • Power supply • Fan Assembly There is a fan, temperature, power, or voltage problem in one or more of the cabinets. The power supply's LEDs may indicate the problem's source. **1** If none of the fans are running, then: **a** Verify 8- to 14-Volt DC power is available to the fan units by checking the wiring connector. If there is 8- to 14-Volt DC power at the connector, there should be power to the fans. If the fans still do not run, replace the fan assembly. **b** If not, then the power unit's fan output is defective or thermally shut down. Let the power unit cool, and recycle AC input power. If no fan output, replace the power unit. If the fans still do not run, escalate the problem. **2** If only 1 of the fans is not running, replace the fan. **3** If every fan can be started, wait 5 minutes and rerun the test. If the test fails again, proceed to Step 4 or 5 as applicable. **4** If the fans are not at high speed, measure the cabinet's temperature at the air intake and the air exhaust at the top of the cabinet. **a** If the 5- to 60^0-C criteria is met, there is a problem with the fans that is preventing the fans from operating at high speed. Replace the fans. If the fans run at high speed, wait 5 minutes to give the cabinet time to cool down and, rerun the test. If the problem persists, go to step 5. **b** If not, the Processor circuit pack is incorrectly reporting this condition. Look for and resolve every error on these MOs first, then rerun the test. **5** If the fans are running at high speed, check the items on following list. Any one of these could be restricting or redirecting the cabinet's air flow. **a** Verify that nothing other than circuit packs in the carrier slots that could be restricting air flow. **b** Verify that no circuit-pack blanks or carrier faceplates are missing. Install and/or replace them as necessary. **c** Be sure the cabinet's doors are properly closed. The doors must be closed to enable the fans to properly cool the cabinet. Wait 5 minutes to allow the fans to cool the cabinet. Rerun the test. If the test still fails, proceed to Step 6.

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Table 240: Test 1533 Power/Fan lead query

Error code	Test result	Description and recommendation
		6 At this point, there should be nothing impeding the air flow, and the fans should be running at high speed. Check the temperatures for the 5- to 60^0-C criteria. **a** If the 5- to 60^0-C criteria exists, a temperature problem exists, and the fans (at high speed) should cool down the switch. Wait 5 minutes, and rerun the test. If the test still fails, the ambient room temperature is probably too high, and the room should be cooled. **b** If not, the fans are defective. Replace the fan assembly, and rerun the test. Failures can occur on the Processor circuit pack that is **not** detected by the respective MO, but that cause many, if not every, environment test to fail. If many environment tests are failing, the suspected circuit pack (depending on the system configuration) should be replaced and the test rerun. **7** There is a problem with the environment of the power system: **8** The power unit for the cabinet may be defective. **a** Verify and, if necessary, replace the power unit. **b** Rerun the test. If the test still fails, escalate.
	PASS	This indicates that the power/fan lead is off and there are no failures in the G650 or G650 stack.
		3 of 3

CAB-TEMP (Cabinet Temperature)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
CAB-TEMP	MINOR	**test board *location***	Cabinet Temperature
CAB-TEMP	MAJOR	**test board *location***	Cabinet Temperature

1 For information on specifying a ***location***, see Command Syntax on page 179.

The MO CAB-TEMP monitors the G650 and the 655A for the following:

- The power supply
  - — Inlet temperature
  - — Hot spot temperature status
  - — Fan speed
  - — Fan alarm lead
- The G650 carrier exhaust temperature

The serial bus is used by the TN2312BP IPSI to obtain this information from each power supply in a G650 media gateway. There is only one outlet temperature sensor and fan assembly in a G650, so information obtained from dual power supplies (slot 0 and 15) is redundant.

Refer to Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 for further information.

NOTE:
Fan/filter replacement procedures for the CMC1 and G600 media gateways are to be found under Variable-speed fans in Chapter 7, Component Replacement in *Maintenance Procedures (555-245-103)*.

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
1 (a)	—	Power supply temperature test (#1537)	MINOR	OFF	**test enviroment *location*** **test board *location***
257 (b)	—	Power supply temperature test (#1537)	MINOR	ON	**test enviroment *location*** **test board *location***

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
513 (c)	—	Power supply temperature test (#1537)	MINOR/ MAJOR [1]	ON	**test enviroment *location*** **test board *location***
769 (d)	—	Power supply fan test (#1538)	MINOR	ON	**test enviroment *location*** **test board *location***

1 This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

Error Notes:

a **Error type 1—**The inlet temperature is over the threshold—120^{o} Fahrenheit (49^{o} Celsius). Run **test board** and check results of Test #1537.

b **Error type 257—**The exhaust temperature is over the threshold—120^{o} Fahrenheit (49^{o} Celsius). Run **test board** and check results of Test #1537.

c **Error type 513—**The hot spot temperature is over the threshold. Run **test board** and check results of Test #1537.

d **Error type 769—**The fan alarm is active. Run **test board** and check results of Test #1537.

System technician-demanded tests: Descriptions and error codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. When you clear error codes associated with the Power Supply Temperature Test(1537), you might also clear errors generated from other tests in the testing sequence.

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Power supply temperature test (#1537)	X	X	ND
Power supply fan test (#1538)	X	X	ND

1 D = Destructive, ND = Nondestructive

Power supply temperature test (#1537)

The power supply temperature test provides the status of the following temperatures:

- Inlet to the power supply (120F/49C)
- Carrier exhaust (120F49C)
- Power supply hot spot status

Table 241: Test #1537 power supply temperature

Error code	Test result	Description and recommendation
1000	ABORT	There is an internal software error. **1** Repeat the command at one-minute intervals 1 to 3 times.
1035	ABORT	The port network is not available. **1** Use the **status port-network** command to verify that the network is not up. **2** Look for alarms against EXP-PN, EXP-INT, PK-INT, etc. **3** Use diagnostic procedures for those MOs to clear the problem.
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. **1** Repeat the command at one-minute intervals 1 to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed. **1** Repeat the command at one-minute intervals 1 to 3 times.
1[1]	FAIL	The inlet temperature is over threshold. **1** Use the **test board** command to check the temperature. **2** If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands Reference (555-245-101) before executing the **recycle carrier** command. **3** Replace the power supply. **4** If the problem persists, check the backplane for shorts.
2	FAIL	The exhaust temperature is over threshold. **1** Use the **test boardt** command to check the temperature. **2** If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands Reference (555-245-101) before executing the **recycle carrier** command. **3** Replace the power supply. **4** If the problem persists, check the backplane for shorts.
4	FAIL	There is a hot spot temperature warning.

1 of 2

Table 241: Test #1537 power supply temperature

Error code	Test result	Description and recommendation
8	FAIL	There is a hot spot temperature shutdown.
	PASS	The inlet, exhaust, and hot spot temperatures are within limits.
	NO BOARD	The power supply is administered but not detected. **1** Verify that the power supply is plugged in. **2** Replace the power supply.
		2 of 2

1 The values of these failure codes might be added together. For example, a value of 3 indicates that both the inlet and the exhaust temperatures are over threshold..

Power supply fan test (#1538)

The power supply fan test verifies that the fan alarm lead from the fan assembly is not active.

Table 242: Test #1538 power supply fan

Error code	Test result	Description and recommendation
1000	ABORT	This is an internal software error.
1035	ABORT	The port network is not available.
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. **1** Repeat the command at one-minute intervals 1 to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed—Retry the command.
	PASS	The fan alarm lead from the fan assembly is not active.
	NO BOARD	The power supply is administered but not detected. **1** Verify that the power supply is plugged in. **2** Replace the power supply.

CABINET (Cabinet Sensors)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CABINET	MAJOR	**test environment** ***location***	Cabinet Sensors
CABINET	MINOR	**test environment** ***location***	Cabinet Sensors

1 For information on specifying a location, see Command Syntax on page 179.

NOTE:
This maintenance object covers environmental maintenance for S8700, S8500, and S8100 media servers equipped with CMC1 or G600 carriers. For S8700 or S8500 media servers equipped with G650 carriers, see acnaoa.

S8700 / S8500

NOTE:
The CABINET MO for S8700 and S8500 media servers is valid only for multicarrier cabinets (MCCs). For information about environmental maintenance on single-carrier cabinets (SCCs), see DC-POWER (Single-Carrier Cabinet Environment) on page 679.

The cabinet sensors monitor cabinet temperature and fan rotation. Variable- speed fans are used extensively in S8700 systems.

The Maintenance circuit pack in an MCC PN monitors a temperature sensor (S1) at the top of the cabinet and generates a major alarm if the exit air temperature exceeds 65 degrees Celsius (149 degrees Fahrenheit). Another temperature sensor in the top of the cabinet (S2) also monitors exit air temperature. If it exceeds 70 degrees Celsius (158 degrees Fahrenheit), the power-distribution unit turns off all cabinet power and invokes emergency transfer. Other sensors monitor fan performance.

The repair procedures that follow rely on your ability to distinguish between high and low fan speeds by the sound of the fans. Experience will allow you to distinguish between the high and low pitches generated by high and low speeds. A thermometer is also required for some of the procedures that follow.

In making replacements, observe the following rules:

- New fan assemblies accept *only* variable-speed fans.
- Old fan assemblies accept either variable- or constant-speed fans.
- Replace a fan assembly (carrier) *only* with a fan assembly of the same type (new for new, old for old).

Variable-Speed Fans

A variable-speed fan is identified by the following features:

- A fan and air filter assembly with product code ED-67077-30, Group 4 or greater, labeled on the front of the carrier
- A 5-pin white connector mounted next to each fan on the fan assembly cover plate for speed control and alarm circuitry
- A 2-pin black -48 V power connector to each fan
- A power filter (ED-1E554-30, G1 or G2) located in a metal box mounted behind the fans on the right-hand cable trough as you face the rear of the cabinet
- The AHD1 circuit pack and the two S4 sensors used with older fan assemblies are *absent*.

Alarm leads from each fan are tied together into a single lead that registers a minor alarm against CABINET whenever a fan's speed drops below a preset limit or fails altogether.

NOTE:
The front fans may run at a different speed than the rear fans since they are controlled by different sensors.

NOTE:
Fan/filter replacement procedures for the CMC1 and G600 media gateways are to be found under Variable-speed fans in Chapter 7, Component Replacement in *Maintenance Procedures (555-245-103)*.

CMC1 / G600 / G650

Environment cabinet tests with a TN2312BP IPSI in a CMC1, G600, or G650

Table 243, Environment cabinet tests for carriers with a TN23BP IPSI, on page 566 lists tests that run when you use the **test environment** command on a G650 with a TN2312BP IPSI circuit pack. The table lists the tests in the order that they are performed when you execute the command. This order differs from previous releases. In this release (2.0) the cabinet-wide tests run first, followed by tests on the 655A power supplies in each carrier. This allows you to exit from the test sequence after cabinet-wide tests are performed without waiting for the power supply tests.

When a TN2312BP IPSI is located in a MCC1 or SCC1 media gateway, maintenance is performed by a TN775 maintenance circuit pack. The **test environment** command for a MCC1 or SCC1 media gateway is the same as in previous releases.

Table 243: Environment cabinet tests for carriers with a TN23BP IPSI

Test[1]	CMC	G600	G650	Short Test	Long Test	D/ND[2]	Release 2.0	Release 1.X
Serial Bus Communications Test (Cab x, **SER-BUS**, 1522)	—	—	X	X	X	ND	X	—
Emergency Transfer Query Test (Cab x, **CAB-EMXF**, 1523)	X	X	X	—	—	ND	X	—
External Alarm Lead Query Test (Cab x, EXT-DEV, 120)	X	X	X	—	—	ND	X	—
External Alarm Lead Query Test (x major, **EXT-DEV**, 120)	X	X	X	—	—	ND	X	—
Cabinet Power/Fan Lead Test (x minor, **CAB-PFL**, 1524)	—	—	X	X	X	ND	X	—
Power Supply Recycle Test (Slot xy00, **PS-VOLT**, 1525	—	—	X	—	X	D/ND[3]	X	—
Power Supply Voltage Test (Slot xy00, **PS-VOLT**, 1526)	—	—	X	X	X	ND	X	—
Power Supply Temperature Test (Slot xy00, **PS-TEMP**, 1528)	—	—	X	X	X	ND	X	—
Power Supply Fan Test (Slot xy00, **PS-TEMP**, 1528)	—	—	X	X	X	ND	X	—
Power Supply Ring Generator Interchange Test (Slot xy00, **PS-RGEN**, 1528)	—	—	X	—	X	D/ND[3]	X	—
Power Supply Ring Generator Status Test (Slot xy00, **PS-RGEN**, 1530)	—	—	X	X	X	D/ND	X	—
Power Supply Recycle Test (Slot xy15, **PS-VOLT**, 1525)	—	—	X	—	X	D/ND[3]	X	—
Power Supply Voltage Test (Slot xy15, **PS-VOLT**, 1526)	—	—	X	X	X	ND	X	—
Power Supply Temperature Test (Slot xy15, **PS-TEMP**, 1528)	—	—	X	X	X	ND	X	—
Power Supply Fan Test (Slot xy15, **PS-TEMP**, 1528)	—	—	X	X	X	ND	X	—

Table 243: Environment cabinet tests for carriers with a TN23BP IPSI

Test[1]	CMC	G600	G650	Short Test	Long Test	D/ND[2]	Release 2.0	Release 1.X
Power Supply Ring Generator Interchange Test (Slot xy15, **PS-RGEN**, 1528)	—	—	X	—	X	D/ND[3]	X	—
Power Supply Ring Generator Status Test (Slot xy15, **PS-RGEN**, 1530)	—	—	X	X	X	D/ND	X	—
[**Tests 1525 through 1530 for all power supplies (slot 00 and 15) in carriers B, C, D, E of G650 stacks**]	—	—	X	—	—	ND	X	—
Ring Generator Test (Cab x, **RING-GEN**, 118)	X	X	—	X	X	ND	X	X
RMC Environment Query Test (Cab x, **RMC-ENV**, 77)	X	X	—	X	X	ND	X	X

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1 x = cabinet, y = carrier

2 D = destructive test, ND = non-destructive test

3 This is a destructive test if you do not specify a slot number or if there is only one power supply in the carrier. It is a non-destructive test if there are operating, redundant power supplies in the carrier.

Error Log Entries and Test to Clear Values

S8700 / S8500

Table 244: S8700 / S8500: Cabinet Sensors Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	**test environment** *UU*
1	0 or 1	Cabinet Temperature Query (#122)	MINOR	ON	**test environment *UU* s r 3**
257	0 or 1	Cabinet Temperature Query (#122)	MAJOR	ON	**test environment *UU* s r 3**

S8100

Table 245: S8100: Cabinet sensors error log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment
1(a) 257 (b) 513 (c) 769 (d) 1025 (e) 1281 (f) 1537 (g) 1793 (h)	Any	Cabinet Temperature or Voltage Query Test (#122)	MAJOR	ON	test environment

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a Error Type: 1 - The Power/Fan Status lead indicates that the power supply of one or more CMC1 cabinets has detected an alarm condition. The condition can be caused by the failure of any fan or the failure of any power supply output. If more than one CMC1 cabinet exists, all of the Power/Fan Status leads are tied together (the fan and power lead is an O-ring of all cabinets' status leads). Since an error condition on a fan or power supply output could be the result of a temporary overload (e.g. during board insertion) or caused by the location of the equipment (e.g. fan blockage), a single event may be an anomaly that eventually clears. However, a repeating condition will cause a major alarm.

b Error Type: 257 - Temperature Sensor 1: Monitors the temperature near the Pentium processor (SPE). Since temperature alarms can be transient, a single event may be an anomaly that eventually clears. However, a repeating condition will cause a major alarm and may indicate a need to replace one or more components (e.g. a Cabinet Fan may be bad, or check to see if the equipment room air conditioning supply/unit is functional).

c Error Type: 513 - Temperature Sensor 2: The temperature sensors are mounted on the TN2314 and monitor the temperature near the disk drive (Windows 2000 C: drive). Since temperature alarms can be transient a single event may be an anomaly that eventually clears. However, a repeating condition will cause a major alarm and may indicate a need to replace one or more components (e.g. a Cabinet Fan may be bad, or check to see if the equipment room air conditioning supply/unit is functional).

NOTE:
An out-of-tolerance voltage condition may be caused by transient conditions (e.g. board insertion or electrical noise). Voltage problems can cause serious damage to the TN2314 or highly unpredictable failure modes. Therefore, a repeating condition will cause a major alarm. The following Error Types 769 through 1793 represents the various system voltages and are listed below:

d Error Type: 769 - Out-Of-Tolerance voltage condition for -48 VDC.

e Error Type: 1025 - Out-Of-Tolerance voltage condition for -5 VDC.

f Error Type: 1281 - Out-Of-Tolerance voltage condition for +5 VDC.

g Error Type: 1537 - Out-Of-Tolerance voltage condition for +12 VDC.

h Error Type: 1793 - Out-Of-Tolerance voltage condition for +3.3 VDC.

System Technician-Demanded Tests: Descriptions and Error Codes

S8700 / S8500

Always investigate tests in the order presented in the table below. By clearing error codes associated with one test, you may also clear errors generated from later tests in the sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND*
Battery & Battery Charger Query test (#5)	X	X	ND
AC Power Query test (#78) (See AC-POWER on page 183)	X	X	ND
OLS Query test (carrier **E**) (#127) (See CARR-POW (Carrier Power Supply) on page 578)	X	X	ND
OLS Query test (carrier **D**) (#127) (See CARR-POW (Carrier Power Supply) on page 578)	X	X	ND
OLS Query test (carrier **A**) (#127) (See CARR-POW (Carrier Power Supply) on page 578)	X	X	ND
OLS Query test (carrier **B**) (#127) (See CARR-POW (Carrier Power Supply) on page 578)	X	X	ND
OLS Query test (carrier **C**) (#127) (See CARR-POW (Carrier Power Supply) on page 578)	X	X	ND
Emergency Transfer Query test (#124) (See EMG-XFER (Emergency Transfer) on page 885)	X	X	ND
Cabinet Temperature Query test (#122) (See CABINET (Cabinet Sensors) on page 564)	X	X	ND

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND*
External Alarm Lead Query test (#120) (See EXT-DEV ADMIN? Y (External Device Alarm) on page 972)	X	X	ND
Analog Ring Generator Initial test (#117) See RING-GEN (Analog Ring Generator) on page 1587)	X	X	ND
Analog Ring Generator Query test (#118) (See RING-GEN (Analog Ring Generator) on page 1587)	X	X	ND

S8100

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Cabinet Test (#122)	X	X	ND
Emergency Transfer Query Test (#124) (a)	X	X	ND
External Alarm Lead Query Test (#120) (b)	X	X	ND
Analog Ring Generator Initialization Test (#117)(c)	X	X	ND
Analog Ring Generator Query Test (#118)(d)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a Refer to EMG-XFER (Emergency Transfer) on page 885 for a description of this test.

b Refer to EXT-DEV ADMIN? N (External Device Alarm) on page 969 for a description of this test.

c Refer to RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

d Refer to RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

Cabinet Temperature Query Test (#122)

This test queries a PN's Maintenance circuit pack for the status of the temperature and fan sensors in the cabinet.

Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** **S8700**: If the test continues to abort with error code 2000, check for power problems with the PN's A carrier. **S8700 MC**: Look for and resolve every AC-POWER and CARR-POW alarm in a multicarrier cabinet or DC-POWER alarm in a single-carrier cabinet. **S8700 IP**:Look for and resolve every RMC-ENV alarm. Repeat the test. **3** **S8700 MC**: If the test continues to abort with error code 2000, check for and resolve every MAINT error in a PN. Repeat the test.
2029 **S8700 S8500**: 2319, 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
S8700 S8500: 1	FAIL	**VARIABLE-SPEED FAN ASSEMBLIES:** One or more fans have stopped. *If none of the fans are running:* **1** Resolve every alarm against CARR-POW (Carrier Power Supply) on page 578 (**S8700 IP**: RMC-ENV). **2** Verify that 48 VDC is available to the fan power filter at the J2F local cable connector. The voltage range is -42.5 V to -52.5 V. There should be 48 VDC between the following pin pairs: 2/3, 8/9, 10/11. If -48 VDC is absent, replace the CFY1B current limiter card. **3** If there are 48 VDC at the power filter's input, exactly follow this procedure to verify that there are also 48 VDC at the power filter's output — to avoid damage to the fan alarm circuit. (Note that the J2F/P2F connectors on the power filter must be disconnected whenever connecting or disconnecting the J2/P2 connectors on the fan assembly.) **c** Disconnect connector J2F from P2F on the top of the filter. **d** Disconnect J2 from P2 on the fan assembly. **e** Reconnect J2F to P2F on the filter. (There should be 48 VDC between the following pin pairs on the J2 connector: 2/3, 8/9, 10/11.) **f** If 48 VDC is present, the fans should have power. Make sure every power connector is sound and making good contact. *(Be sure to disconnect the J2F/P2F connector again before reconnecting the J2/P2.)* **g** If not, replace the fan power filter using the previous procedure described. *(Be sure to disconnect the J2F/P2F connector again before reconnecting the J2/P2.)*
S8700 S8500: 1 *(cont'd)*	FAIL *(cont'd)*	*If some of the fans are running and some are not:* **1** Replace the defective fans. If every fan can then be started, wait 5 minutes and rerun the test. If the test fails again, proceed to the next step. **2** Remove all six white 5-pin connectors on the front and back of the fan assembly. This will cause every fan to run at high speed and the alarm to be cleared. **S8700 MC**: If the alarm does not clear, a PN's Maintenance circuit pack is incorrectly reporting the problem. Check for and resolve every error against MAINT, and then rerun the test. **3** One at a time, replace the 5-pin connectors and check to see if the alarm recurs. Replace each fan whose reconnection causes a recurrence of the alarm.

Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
S8700 S8500: 1 *(cont'd)*	FAIL *(cont'd)*	**NONVARIABLE-SPEEDFAN ASSEMBLIES** (older or upgraded cabinets): The AHD1 circuit pack has reported an air-flow problem. The temperature difference between the air intake and the air exhaust is at least 15^0C (59^0F)) and the absolute temperature at the top of the cabinet is at least 50^0C (122^0F). The fans should be running at high speed. If none of the fans are running then: **1** Look for an resolve every alarm against CARR-POW (**S8700 IP**: RMC-ENV). **2** Verify that 48 VDC is available to the fan wiring harness connector between pin pairs 2/3, 8/9, and 10/11. The tolerable range for this measurement is -42.5 V to -52.5 V. If 48 VDC is present and the fans are not running, replace the AHD1 circuit pack. **3** If the fans still do not run, escalate the problem. **4** If 48 VDC is absent, replace the CFY1B current limiter card. If the fans still do not run, escalate the problem. If some fans are running and some not, replace the defective fans. **5** If every fan can then be started, wait 5 minutes, and rerun the test. If the test fails again, proceed to the next step. **6** If every fan is running but not at high speed, measure the cabinet temperature at the air intake and the air exhaust at the top of the cabinet. **h** If the 15^0-/50^0-C criteria is met, there is a problem with the AHD1 circuit pack or the fans. Replace the AHD1 circuit pack and/or fans. If the fans run at high speed, wait 5 minutes for the cabinet to cool, then retest. If the test fails, escalate the problem. **i** If the 15^0-/50^0-C criteria is not met, then environmental maintenance is incorrectly reporting this condition. Resolve every error (**S8700 MC**: MAINT) and retest. If the test fails, escalate the problem.

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Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
S8700 S8500: 1 *(cont'd)*	FAIL *(cont'd)*	**NONVARIABLE-SPEEDFAN ASSEMBLIES** (continued): If the fans are running at high speed, check the following items, any of which can restrict or redirect airflow within the cabinet. **1** Check both filters. If a filter is dirty or clogged, clean with soapy water or a vacuum. **2** Ensure that there is nothing other than circuit packs in the carrier slots that could be restricting the airflow. **3** Ensure that there are no missing circuit-pack faceplates or blanks. **4** The cabinet door must be closed for proper cooling. **5** Wait 5 minutes for the cabinet to cool and rerun the test. **6** If the test fails, check temperatures for the 15^0-/50^0-C criteria. If the 15^0-/50^0-C criteria is present, then the fans should be running at high speed. **7** Wait 5 minutes, and rerun the test. **8** If the test still fails, then the ambient room temperature is probably too high. Cool the room. **9** If the 15^0-/50^0-C criteria does not exist, one of the following components if defective: • AHD1 circuit pack • fans • S3 sensors • S4 sensors Replace these items one at a time in the order listed, running the test after each replacement. **S8700 MC**: If many environmental tests are failing, it can be a problem that is undetected by maintenance on a PN's Maintenance circuit pack. Replace the circuit pack. Escalate if the problem persists.

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Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
S8100: 1	FAIL	There is a fan, temperature, power or voltage problem in one or more of the cabinets. The LEDs on the power supply may indicate the problem source. Otherwise follow the procedures below for each cabinet: From a LAC bash, type “environment”. Note voltage ranges and temperature of cabinet. **1** If none of the fans are running, then verify 8-14 volt DC power is available to the fan units by checking the wiring connector. • If there is 8-14 volt DC power at the connector, there should be power to the fans. If the fans still do not run, replace the fan assembly. • If there is no 8-14 volt DC power at the connector, then the power unit fan output is defective or thermally shut down. Let the power unit cool and recycle AC input power. If no fan output, replace the power unit. If the fans still do not run, escalate the problem. **2** If only 1 of the fans is not running, replace the fan. **3** If all the fans can be started, wait five minutes and rerun the test. If the test fails again, proceed to Step 4 or 5 as applicable.
S8100: 1	FAIL *(cont’d.)*	**4** If the fans are not at high speed, measure the cabinet temperature at the air intake and the air exhaust at the top of the cabinet. **j** If the 5 - 60^0 C criteria is met, there is a problem with the fans that is preventing the fans from operating at high speed. Replace the fans. If the fans run at high speed, wait 5 minutes to give the cabinet time to cool down and, rerun the test. If the problem persists, go to step 5. **k** If the 5 - 60^0 C criteria is not met, the Processor circuit pack is incorrectly reporting this condition. Look for and resolve all errors on these maintenance objects first, then rerun the test. **5** If the fans are running at the high speed, check the items on list that follows. Any one of the items could be restricting or redirecting the flow of air within the cabinet. **l** Check filter. If the filter is dirty or clogged it should be cleaned or replaced. The filter can either be washed with soap and water or vacuumed. **m** Make sure there is nothing other than circuit packs in the carrier slots that could be restricting the air flow. **n** Make sure there are no missing (blank) circuit pack or carrier faceplates. Install and/or replace them as necessary. **o** Make sure the cabinet doors are properly closed. The doors must be closed for the fans to be able to properly cool the cabinet. Wait five minutes to give the fans a chance to cool the cabinet. Rerun the test. If the tests still fails, proceed to Step 6.

Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
S8100: 1	FAIL *(cont'd.)*	**6** At this point, there should be nothing impeding the air flow, and the fans should be running at high speed. Check the temperatures for the 5 - 60^0 C criteria. **p** If the 5 - 60^0 C criteria exists, a temperature problem exists, and the fans (at high speed) should cool down the switch. Wait five minutes and rerun the test. If the test still fails, the ambient room temperature is probably too high, and the room should be cooled. **q** If the 5 - 60^0 C criteria does not exist, the fans are defective. Replace the fan assembly and rerun the test. Failures can occur on the Processor circuit pack that **is not** detected by the respective maintenance object, but that cause many, if not all, environment tests to fail. If many environment tests are failing, the suspect circuit pack (depending on the system configuration) should be replaced and the test rerun.
S8100: 1	FAIL *(cont'd.)*	There is a problem with the environment of the power system: **7** The power unit for the cabinet may be defective. **r** Verify and, if necessary, replace the power unit **s** Rerun the test. If the test still fails, proceed to Step 8.
S8700 S8500: 2	FAIL	A temperature problem due to the S1 sensor detecting a temperature of at least 65^0 C (149^0 F) has been reported. The entire cabinet is in danger of power-down if the temperature reaches 70^0 C (158^0 F). **1** If any of the fans are not running, there should be a FAIL with Error Code 1 present. Follow the procedures for that Error Code, noting the differences for variable- and constant-speed fan assemblies. **2** If the fans are running, check the temperature at the top of the cabinet. **t** If the temperature is at least 65^0 C (149^0 F), the ambient room temperature is too high and the fans cannot cool the system. Unless the room temperature is reduced, the system will shut down soon. **3** If the temperature at the top of the cabinet is less than 65^0 C (149^0 F), either the S1 sensor (**S8700 MC**: or a PN's Maintenance circuit pack) is incorrectly reporting the problem. **u** Resolve any errors against the S1 sensor (**S8700 MC**: or against MAINT), then rerun the test. **v** If there are still errors, replace the S1 sensor and retest. If the test fails, escalate.

Table 246: Test #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
S8700 S8500: 3	FAIL	Fan failures and temperature alarms have been reported. **1** Resolve the fan failure (Error Code 1). This should also resolve the temperature alarm. (With constant-speed fan assemblies, fan failures correspond to air-flow problems.)
	PASS	Temperature measurements and fan performance are satisfactory.

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CARR-POW (Carrier Power Supply)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CARR-POW	MAJOR	**recycle carrier *location***	Carrier Port Power Supply

1 For information on specifying a location, see Command Syntax on page 179.

S8700 Multi-Connect systems support two different cabinet types for PNs. Both cabinet types may be powered by either AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply.

CAUTION:
Before powering down a cabinet or carrier that contains EMBEDDED AUDIX circuit packs (TN566), first power down the AUDIX unit to avoid damaging the AUDIX software. Instructions for powering down this unit are in the Removing and restoring EMBEDDED AUDIX power in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* on the circuit pack, and in *DEFINITY AUDIX System Release 3.2.4 Maintenance, 585-300-110*.

The CARR-POW MO represents the pair of power supplies that supply +5V, -48V and -5 VDC power to each carrier in a multicarrier cabinet. In AC-powered cabinets, these are called Off Line Switches (OLS); in DC-powered cabinets, they are DC/DC converters.

Cycling Power Supplies

When a port carrier power supply problem is reported by hardware, the system can cycle the power supplies in that carrier. When a carrier is cycled, the power supplies are turned off for 2 seconds and then turned back on. The system cannot cycle the power supplies on any of the following types carriers even if they are duplicated:

- Expansion control carrier
- Switch node carrier
- Single-carrier cabinet

WARNING:
When port carrier power is cycled, all service dependent upon circuit packs in that carrier is disrupted.

Carrier Port Power Supplies — Multicarrier Cabinets

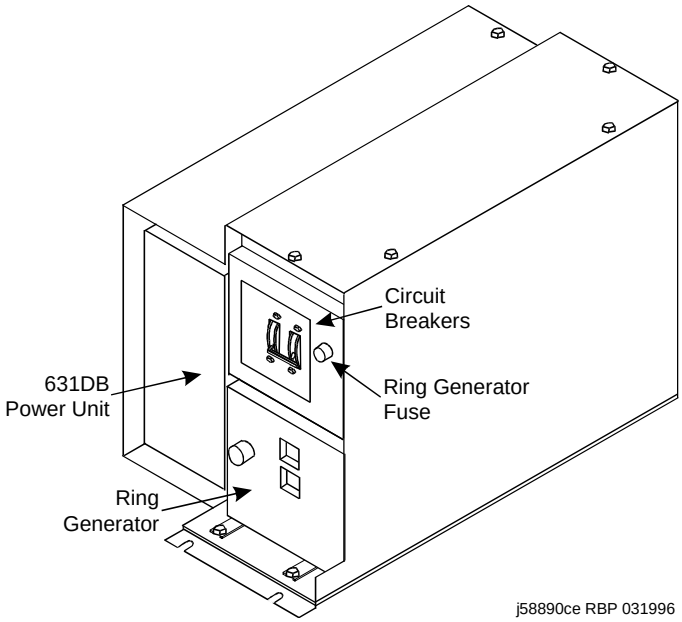
Code	System Power	Output (VDC)	Location
631DA	AC	+5	Left side
631DB	AC	-48/-5	Right side
644A	DC	+5	Left side
645B	DC	-48/-5	Right Side
TN755B		165	Slots 17 and 18
631WA/AR	AC	+5	Left side
631WB/BR	AC	-48	Right side
TN736	AC	-5	Used with 631
TN752	AC	165/-5	WA/WB or AR/AB
649A	AC	-48 at 10 Amps +5 VDC and -5 VDC at 6 Amps	Right side on control and port carriers. Left and right side on switch node carriers.

AC-Powered Cabinets

AC Power-Distribution Unit and Battery Charger (J58890CE-2)

Figure 36, AC Power-Distribution Unit (J58890CE-2) — Front, on page 580 shows an AC power-distribution unit (List 9 or List 10). This unit sits at the bottom of some multicarrier cabinets.

Figure 36: AC Power-Distribution Unit (J58890CE-2) — Front

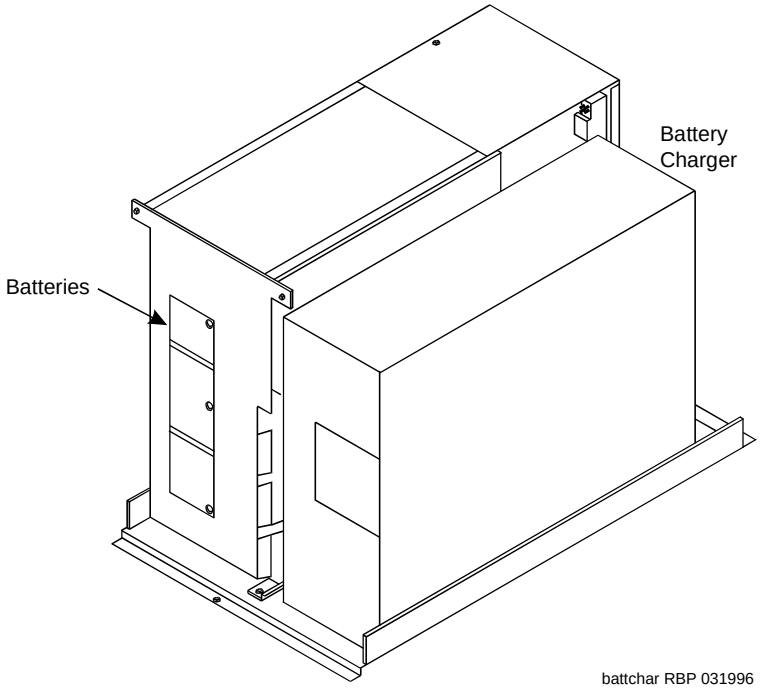


The AC power-distribution unit contains the following components:

- Circuit breaker
- Electromagnetic Interference (EMI) filter
- Ring generator
- AC input fuse
- 20-Amp fuses
- Signal connector
- -48 VDC fan power

The optional battery charger (List 11) sits at the bottom of some multicarrier cabinets. See Figure 37, Battery Charger (Optional Part of J58890CE-2) — Front, on page 581.

Figure 37: Battery Charger (Optional Part of J58890CE-2) — Front

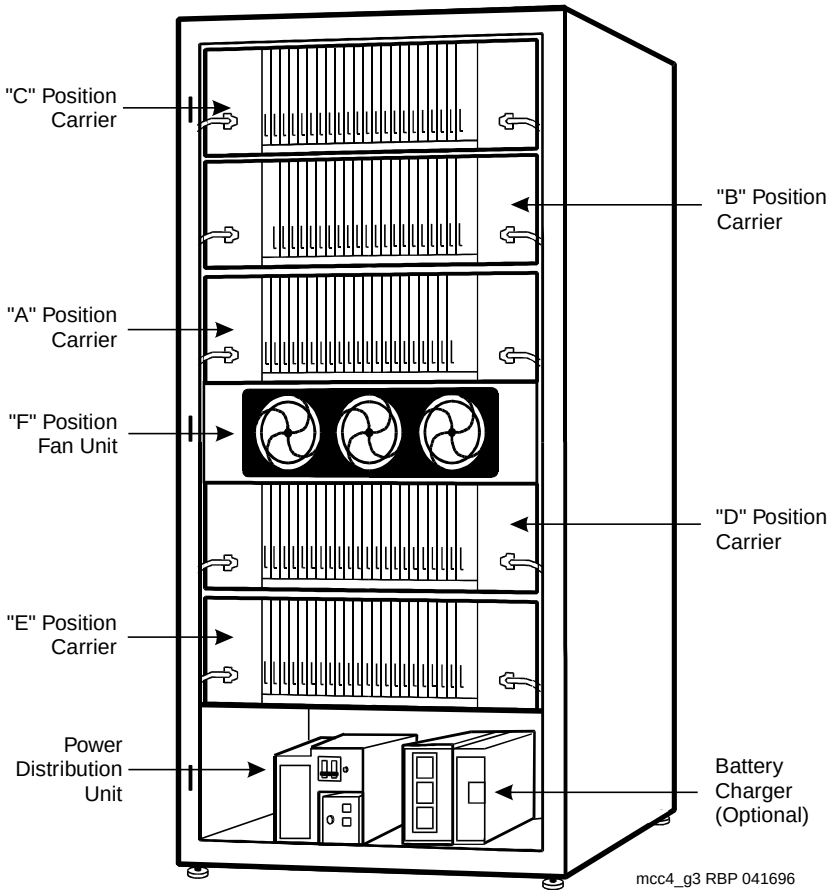


The charger is used only without an uninterruptible power supply (UPS). The charger contains:

- Three 48 VDC batteries for backup power to the cabinet
- A DC power relay to automatically switch the batteries into the power circuit if a main power failure is detected

Figure 38, AC Power Distribution in Multicarrier Cabinets, on page 582 shows AC power distribution in some multicarrier cabinets. The DC power-distribution cables are on both sides of the cabinet. **These cables supply power to each of the carriers**. The optional battery charger is at the right side of the power-distribution unit.

Figure 38: AC Power Distribution in Multicarrier Cabinets



Power Backup

If AC power fails, three 48-V DC batteries power the system for:

- 15 seconds in a PN cabinet
- 10 minutes in the expansion control carrier in the “A” position of a PN cabinet

Uninterruptible Power Supply

An external UPS provides a longer backup time than holdover batteries and can replace the batteries and battery charger. The unit connects from the AC power source to a cabinet’s AC power cord. If AC power fails, the unit supplies its own AC power to the cabinet.

J58890CH-1

In AC-powered cabinets, the power-distribution unit (J58890CH-1), distributes 170 to 264 VAC from a wall outlet to a set of BU3200A Battery Interface Units (BIU). See Figure 39, AC Power-Distribution Unit (J58890CH-1) — Front, on page 583 and Figure 40, Power-Distribution Unit (J58890CH-1), on page 583.

Figure 39: AC Power-Distribution Unit (J58890CH-1) — Front

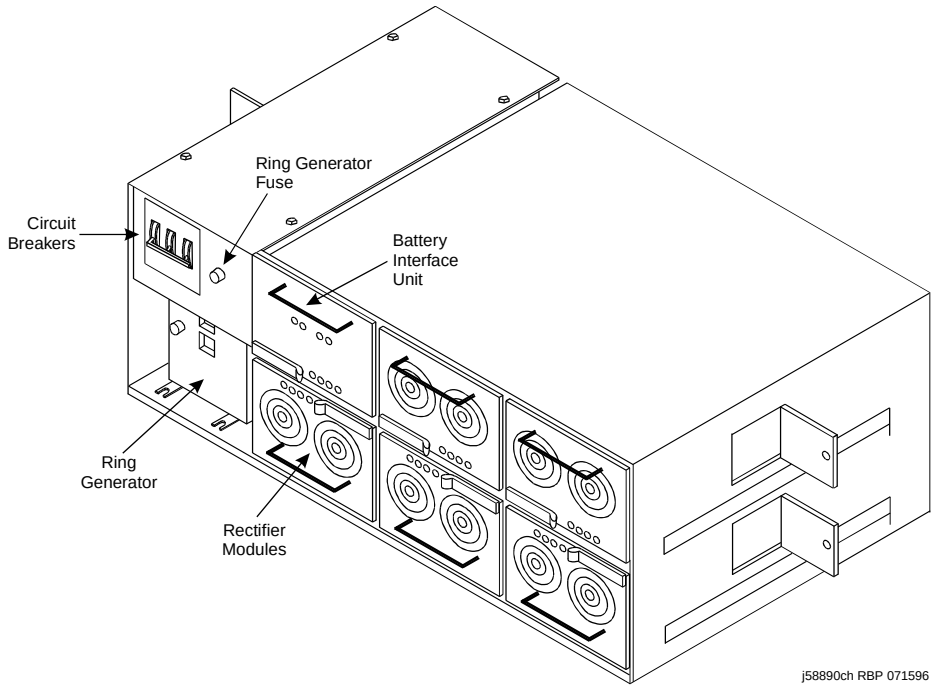
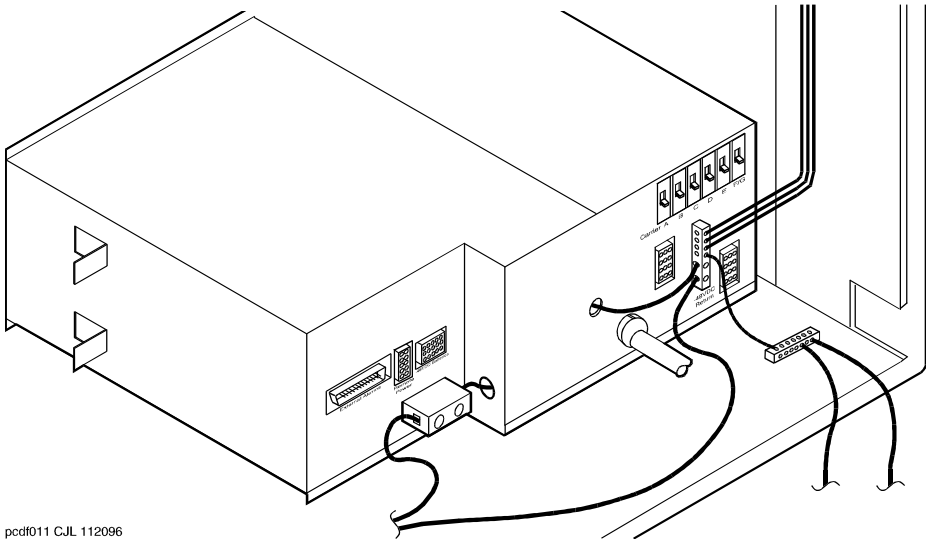


Figure 40: Power-Distribution Unit (J58890CH-1)



Power Backup

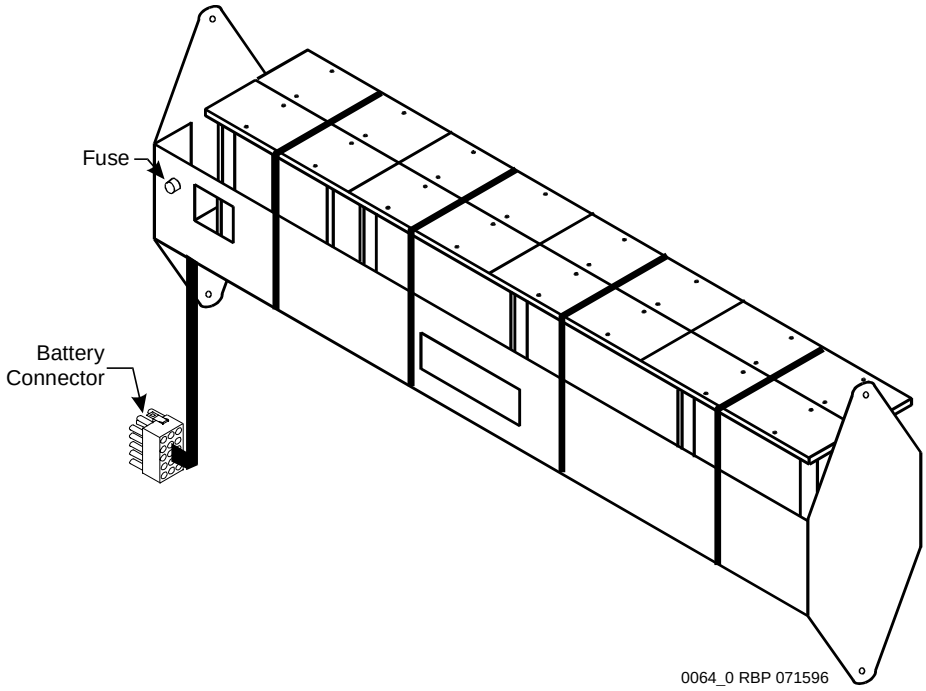
The small battery is at the center rear of the multicarrier cabinet. This 8-AH (Amp Hour) battery is fused for short circuit protection and is charged by the J58890CH-1. The batteries also contain a thermal sensor that changes the charging voltage depending on battery temperature.

The small batteries provide short-term battery holdover. If AC power fails, 48-V DC batteries power the system for:

- 15 seconds in a PN cabinet
- 10 minutes in the expansion control carrier in the “A” position of a PN cabinet

Figure 41, Small Battery Assembly, on page 584 shows the small battery assembly.

Figure 41: Small Battery Assembly

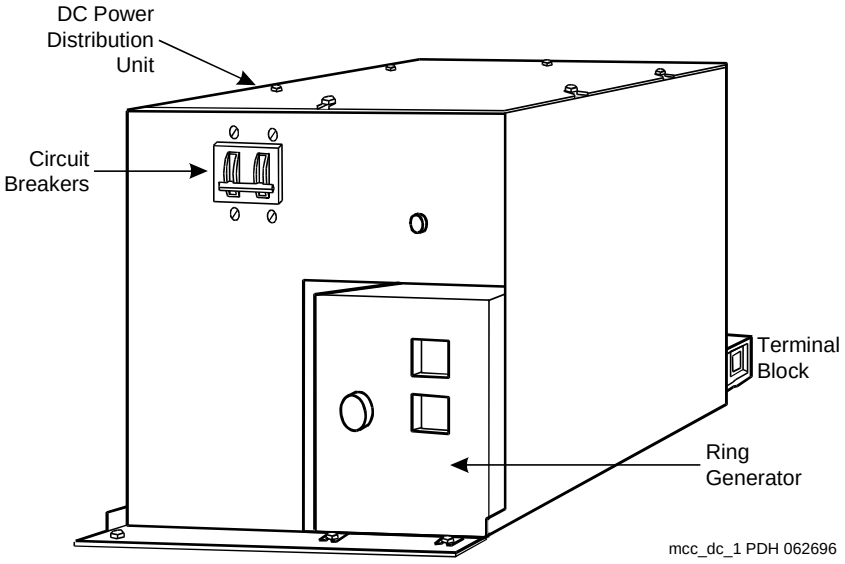


DC-Powered Cabinets

DC Power-Distribution Unit (J58890CF-2)

Figure 42, DC Power-Distribution Unit (J58890CF-2) — Front, on page 585 shows a power-distribution unit in some DC-powered multicarrier cabinets. The unit sits at the bottom of the cabinet and contains the ring generator, 20-Amp circuit breakers, terminal blocks, and system fan power.

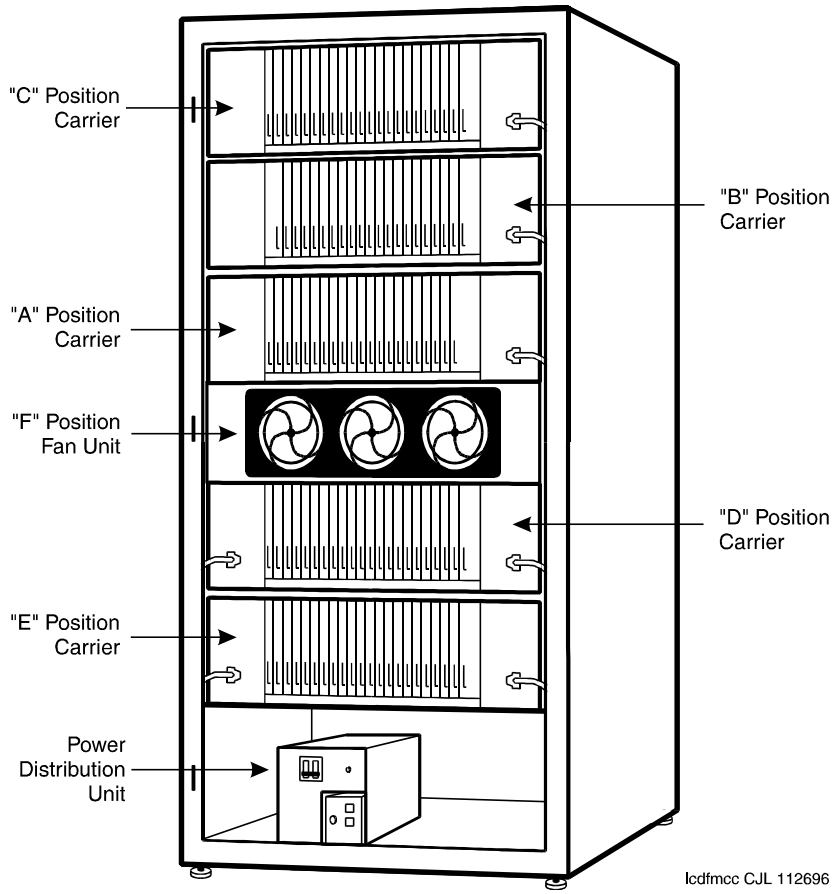
Figure 42: DC Power-Distribution Unit (J58890CF-2) — Front



Some carriers may contain two power supplies, the 644A and the 645B, that together supply the required voltages to the carrier. Other carriers may contain one 649A power supply located on the right side of the carrier. In these systems, an additional 649A is located on the right of the optional switch node carriers.

Figure 43, Typical Multicarrier Cabinet with 649A Power Units, on page 586 shows a typical AC-powered multicarrier cabinet.

Figure 43: Typical Multicarrier Cabinet with 649A Power Units



The table below shows what carriers are protected by each circuit breaker on the J58890CF-1. The ring generator is protected by a fuse located next to the main circuit breaker on the front of the unit.

Circuit Breaker	Associated Carriers
CB1	Carrier A, both sides
CB2	Carrier B, both sides
CB3	Carrier C, both sides
CB4	Carrier D, both sides
CB5	Carrier E, both sides
CB6	Level F (Fans) and Level G (Ring Generator)

The table below shows what carriers are protected by each circuit breaker on the J58890CH-1. The ring generator is protected by a fuse located next to the main circuit breaker on the front of the unit.

Circuit Breaker	Associated Carriers
CB1	Carrier A, both sides
CB2	Carrier B, both sides
CB3	Carrier C, both sides
CB4	Carrier D, both sides
CB5	Carrier E, both sides
CB6	Level F (Fans) and Level G (Ring Generator)

Neon Lamp Power

The system can also support neon message waiting lamps on analog telephones. Any carrier containing a TN769 Neon Analog Line circuit packs must also be supplied with 150 Volts from a TN755B power supply circuit pack. See the table above for other supported neon power circuit packs.

Error Log Entries and Test to Clear Values

Table 247: Carrier Port Power Supply Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1[1]	0 or 1	OLS Query test (#127)	MAJOR	ON	**test environment *UU* r 2** **recycle carrier *UUC***

1 Run the OLS Query test (#127) first using the **test environment** UU **r 2** command. Then, if a carrier must be recycled to clear the CARR-POW alarm, use the **recycle carrier** UUC command to run the OLS Recycle test (#126). The OLS Recycle test (#126) is not included in either the long or short test sequences.

WARNING:
The OLS Recycle test (#126) is destructive. For more information, see OLS Recycle Test (#126) on page 588.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the *Battery & Battery Charger Query* test (#5), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query test (#5) (a)	X	X	ND
AC Power Query test (#78) (b)	X	X	ND
OLS Query test (carrier E) (#127)	X	X	ND
OLS Query test (carrier D) (#127)	X	X	ND
OLS Query test (carrier A) (#127)	X	X	ND
OLS Query test (carrier B) (#127)	X	X	ND
OLS Query test (carrier C) (#127)	X	X	ND
OLS Recycle Carrier test (#126)			D
Emergency Transfer Query test (#124) (c)	X	X	ND
Cabinet Temperature Query test (#122) (d)	X	X	ND
External Alarm Lead Query test (#120) (e)	X	X	ND
Analog Ring Generator Initialization test (#117) (f)	X	X	ND
Analog Ring Generator Query test (#118) (f)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a Refer to POWER section for a description of this test.

b Refer to AC-POWER section for a description of this test.

c Refer to EMG-XFER (Emergency Transfer) section for a description of this test.

d Refer to CABINET (Cabinet Sensors) section for a description of this test.

e Refer to EXT-DEV (External device alarm) section for a description of this test.

f Refer to RING-GEN (Analog Ring Generator) section for a description of this test.

OLS Recycle Test (#126)

This test is **destructive**.

This test removes power from the specified carrier and causes every circuit pack in the recycled carrier to be removed and inserted. These actions cause every call originating from or terminating to circuit packs in this carrier to be dropped. The pair of OLSs in the specified carrier is recycled. Both OLSs in the carrier are turned off for 2 seconds and then back on again. After the OLSs have been turned back on, the test queries a PN's Maintenance circuit pack for the status of the pair of OLSs in the specified carrier. If both OLSs are on and functioning, then the test passes. If both OLSs are not on and functioning, the test fails, and BOTH OLSs are turned off.

Table 248: Test #126 OLS Recycle Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1366	ABORT	Indicates that the active Tone-Clock for the PN is in requested carrier. **1** If duplicated Tone-Clock boards or IPSIs exist, use**set tone-clock** to switch Tone-Clocks, otherwise the power cannot be cycled. **2** If the switch succeeds, rerun the test.
1367	ABORT	Indicates that the active Expansion Interface link for the PN is in requested carrier. **1** If duplicated EIs exist, use **reset pnc interchange** to switch EIs, otherwise the power cannot be cycled. **2** If the switch succeeds, rerun the test.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2029, 2319, 2320, 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	There is a problem with one or both OLSs on the cycled carrier. **1** Since the OLS Recycle test failed, both OLSs in the cycled carrier should have been powered off by the system software. Both OLSs should be showing a red status LED, instead of an amber one. Since the OLS Query test is a subset of the OLS Recycle test, the OLS Query test (#127) should also fail. Run the OLS Query test by using the **test environment *UU*** command where UU is the appropriate cabinet number. **2** If Test #127 fails, follow the repair procedures described for Test #127.
	PASS	Both OLSs in the recycled carrier were found to be healthy by a PN's Maintenance circuit pack after the OLSs were powered down and back up. If the status LEDs on both OLSs are not showing amber, then the MAINT (Maintenance) circuit pack may have incorrectly reported the state of the OLSs. Resolve any alarms on these MOs.

Off-Line Switcher (OLS) Query Test (#127)

This test queries the the PN's Maintenance for the status of the pair of OLSs in the specified carrier. If both OLSs are on and functioning, then the test passes. If both are not on and functioning, it fails.

Table 249: Test #127 OLS Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to ABORT with error code 2000, check for system powering problems with the PN's A carrier. Resolve every AC-POWER and CARR-POW alarm in a multicarrier-cabinet system or DC-POWER alarm in a single-carrier cabinet system. Then, repeat the test. **3** If the test continues to ABORT with a 2000 error code, resolve any errors against the PN's MAINT (Maintenance circuit pack). Then, repeat the test.
2029, 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	**AC-POWERED SYSTEMS** There is a problem with one or both OLSs on the tested carrier. **1** For each OLS that has every status LED OFF, check the AC input to the OLS at the OLS outlet. If there is no AC, then check the appropriate fuses for the affected OLS. Replace open fuses. If the fuses open again or AC does not show up at the OLS outlet, then there is probably a power wiring problem in the cabinet. **2** At this point, AC should be present at the OLS outlet. Use **recycle carrier *UUC*** (where *UUC* is the appropriate cabinet and carrier) in an attempt to bring back the OLSs for this carrier. If the test passes, the trouble is cleared. If the test does not pass, one OLS or both, in the tested carrier is defective. If only one OLS is defective, then the status LEDs on the healthy OLS will light green for a moment. When the recycle test determines that both OLSs are defective, the software will turn off power to both the good and defective OLSs. This will cause the status LED(s) on the good OLS to light red. **3** Unplug both OLSs, and wait approximately 1-minute to allow the OLSs to cool down. Plug in the OLSs. If either OLS is operating properly (the status LEDs show green), then replace the defective OLS(s). See OLS Replacement Procedures in this section.

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Table 249: Test #127 OLS Query Test

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	**4** If the replaced OLS(s) still do not operate properly, then a circuit pack or a defective telephone connected to a circuit pack in the affected carrier could be causing an electrical load that is preventing the OLS from operating properly. Unseat every circuit pack in the carrier, and reissue the **recycle carrier** command. **w** If the recycle passes, then the OLSs are healthy, and the problem is with one of the circuit packs. Reinsert the circuit packs one at a time. If the status LED shows red after reinserting a circuit pack, then replace the defective circuit pack. If the status LED still shows red, then remove the amphenol connector on the back of the slot containing this circuit pack and reissue the **recycle carrier** command. If the status LED shows green, then the problem is with one of the telephones or the wiring to one of the telephones on this slot. **x** If either OLS still shows a red status LED, then check for bent pins and cable placement in the affected carrier. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but that will cause many, if not every, environment test to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun.
	FAIL	**DC-POWERED SYSTEMS** There is a problem with one or both port carrier power supplies on the tested carrier. **1** For each port carrier power supply that has every status LED OFF, check the DC input to the port carrier power supply at the port carrier power supply outlet. If there is no DC, then check the appropriate circuit breakers for the affected port carrier power supply. If the circuit breaker has tripped, reset the circuit breaker. If the circuit breaker trips again or if DC is absent at the port carrier's power supply outlet, then there is probably a power wiring problem in the cabinet. **2** At this point, DC should be present at the port carrier power supply outlet. Use the **recycle carrier *UUC*** command (where *UUC* is the appropriate cabinet and carrier) in an attempt to bring back the port carrier power supplies for this carrier. If the test passes, the trouble is cleared. If the test does not pass, one port carrier power supply, or both, in the tested carrier is defective. If only one port carrier power supply is defective, then the status LEDs on the healthy port carrier power supply will light green for a moment. When the recycle test determines that both port carrier power supplies are defective, the software will turn off power to both the good and defective port carrier power supplies. This will cause the status LED(s) on the good port carrier power supply to light red.

Table 249: Test #127 OLS Query Test

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	**3** Unplug both port carrier power supplies, and wait approximately 1-minute to allow the power supplies to cool down. Plug in the power supplies. If either power supply is operating properly (the status LEDs show green), then replace the defective power supplies). **4** If the replaced port carrier power supply(s) still do not operate properly, then a circuit pack or a defective telephone connected to a circuit pack in the affected carrier could be causing an electrical load that is preventing the power supply from operating properly. Unseat every circuit pack in the carrier, and reissue the **recycle carrier** command. **y** If the recycle passes, then the port carrier power supplies are healthy, and the problem is with one of the circuit packs. Reinsert the circuit packs one at a time. If the status LED shows red after reinserting a circuit pack, then replace the defective circuit pack. If the status LED still shows red, then remove the amphenol connector on the back of the slot containing this circuit pack and reissue the **recycle carrier** command. If the status LED shows green, then the problem is with one of the telephones or the wiring to one of the telephones on this slot. **z** If either port carrier power supply still shows a red status LED, then check for bent pins and cable placement in the affected carrier. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but that will cause many, if not every, environment test to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun.
	PASS	AC-POWERED SYSTEMS Both OLSs in the tested carrier were found to be healthy by the PN's Maintenance circuit pack. If the status LEDs on both OLSs are not showing green, then the PN's MAINT circuit pack may have incorrectly reported the state of the OLSs. Resolve any alarms on these MOs. DC-POWERED SYSTEMS Both power supplies in the tested port carrier were found to be healthy by the PN's Maintenance circuit pack. If the status LEDs on both power supplies are not showing green, then the MAINT circuit pack may have incorrectly reported the state of the power supplies. Resolve any alarms on these MOs.

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CDR-LNK (Call Detail Recording Link)

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
CDR-LINK	MINOR	**test cdr [primary | secondary] l**	CDR Link
CDR-LINK	WARNING	**test cdr [primary | secondary]**	CDR Link

Refer to PRI-CDR/SEC-CDR (Call Detail Recording Link) on page 1556 for Call Detail Recording Link problems.

CDR-LNK (CDR Link)

S8100 only

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
CDR-LINK	MINOR	test cdr-link	CDR Link
CDR-LINK	WARNING	test cdr-link	CDR Link

The CDR feature records detailed call information on incoming and outgoing calls on specified trunk groups and on calls set up between local stations based on the options specified using the **change system-parameters cdr** command. The CDR feature stores this call duration information in a CDR output file on S8100. This information is read by a Call Accounting Software (CAS) application software package running on a user-provided PC.

CDR Link Maintenance provides a strategy for verifying that the CDR files generated by S8100 are being retrieved by the CAS application software running on the customer's PC. This strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems.

S8100 and the customer's PC are connected to a LAN which allows the CDR directory on the Communication Manager server to be mapped to a directory on the PC. The CDR software on S8100 writes CDR records to a cdr.out file on its hard drive. Every 10 minutes S8100 renames the file as cas.in if the cas.in file does not exist and opens a new cdr.out file. Within a few minutes after the cas.in file is created, the CAS software on the PC should read and delete the cas.in file to allow the S8100 to move a new cdr.out file to cas.in at the next 10 minute trigger.

The CAS software running on the customer's PC should retrieve the data from the cas.in file and delete the file at least every 10 minutes to allow S8100 to move the cdr.out file to the cas.in file. The size of the cdr.out file has been engineered to not fill up as long as the transfer takes place within 10 minutes. If the cas.in file is not removed by CAS by the time S8100 needs to rename cdr.out to cas.in, S8100 sets the state of the CDR link to "down" and keeps writing to the cdr.out file until the cdr.out file reaches a maximum size, at which time a CDR-LINK alarm is generated. New CDR data will continue to be written to an internal buffer on DEFNITY ONE but eventually that buffer will be filled up and CDR data will be lost. To clear the problem, the cas.in file must be deleted by the CAS system. The CDR link will then be put in the "up" state, the cdr.out file will be renamed to cas.in, and the buffered CDR data along with new CDR data will be written to the cdr.out file.

The ability for S8100 to move the cdr.out file to the cas.in file is monitored by the CDR-LINK Maintenance Object. From a user's viewpoint the CDR-LINK MO is similar to the PRI-CDR link MO used by Communication Manager to provide maintenance of the physical link between the Communication Manager server and an external CDR device. The S8100 CDR-LINK MO can be tested using the **test CDR-LINK** command, it can be busied out and released with the **busyout CDR-LINK** and **release CDR-LINK** commands, and it has an "up" and "down" state as displayed by the **status CDR-LINK** command.

Procedures for Restoring the CDR Link

1 Get the status of CDR links.

Enter **status cdr-link** command and make sure that the CDR links are not busied out for maintenance. If the link is down, then continue to the next step.

2 Verify that the PC running the CAS application software is in service and that the CAS application software is running.

3 Verify that the Cdr directory on S8100 is shared. For more information about the Cdr directory, see "Set up Call Accounting" in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*.

4 Verify that the customer's PC has a drive mapped to the shared directory on S8100 (see Possible Problem Areas below).

5 Log on to S8100 and select the "bash" application. From the bash session, change the current directory to *d:/LucentData/Cdr* (**cd d:/LucentData/Cdr**). Verify that the cas.in file is being read and deleted by CAS every few minutes by checking that a new cas.in file is created every 10 minutes (**ls -l cas.in**) and that it is removed within a few minutes after it is created.

NOTE:
To prevent generating false alarms when CDR is administered on S8100 but the CAS software on the PC is not operational, the CDR link can be busied out using the ***busyout CDR-LINK*** command.

Possible Problem Areas

1 The CDR directory (d:/LucentData/Cdr) on S8100 has to be shared with full control permissions from S8100. For more information about the Cdr directory, see "Set up Call Accounting" in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*.

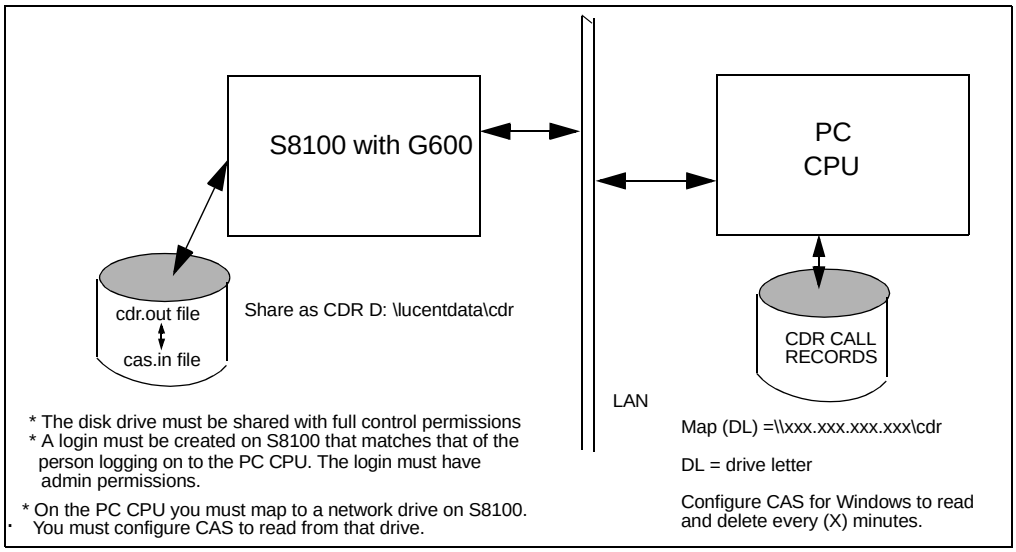
2 A login has to be created on S8100 that matches the login of the person logging into the WINDOWS 95 PC running the CAS application.

3 The login used for CAS on S8100 has to have administration rights.

4 On the WINDOWS 95 PC, the network drive used by CAS has to be mapped to the CDR directory on S8100.

5 CAS on the WINDOWS 95 PC has to be configured to read the mapped drive.

Figure 44: CDR Configuration



Error Log Entries and Test to Clear Values

Table 250: CDR Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test cdr-link sh
18 (a)	0	busyout cdr-link	WARNING	OFF	release cdr-link
257 (b)	Any	Link Retry Test (#215)	MINOR/ WARNING[2]	OFF	test cdr-link
513 (c)	Any				test cdr-link

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a System Technician has busied out the CDR link to the out-of-service state. No CDR records will be written to the cdr.out file on S8100.

b Link Retry Test (#215) fails. Refer to Procedures for Restoring the CDR Link on page 594 for resolution.

c The CDR link is down since the CAS system has not deleted the cas.in file in time for S8100 to move the cdr.out file to the cas.in file. Use the **status CDR-LINK** command to verify that the link is down and refer to Procedures for Restoring the CDR Link on page 594 for resolution. This error indicates that the CAS system is in an off-line state. Enter **test cdr-link** command to verify that the CDR link is back in the UP state.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Link Retry Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Table 251: CDR link system technician-demanded tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down Test (#213)		X	D
Link Retry Test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test puts the CDR logical link in a DOWN state for S8100. The link will be restored to the UP state automatically by the Link Retry test (#215). The Link Tear Down test is used to help verify that the Link Retry test (#215) will return the state of the link to UP if the cdr.out file is not full. On Communication Manager, this test is used to actually take down the physical link to a CDR output device but on S8100 there is no hardware link to control.

CDR records will continue to be written to an internal buffer when the link is down so this is may not be a destructive test as long as the link is restored by the Link Retry test which is executed as part of the sequence of tests run for the **test cdr-link long** command.

Table 252: TEST #213 Link Tear Down Test

Error Code	Test Result	Description/ Recommendation
40	ABORT	Internal system error
50	ABORT	Internal system error **1** Retry the command at 1-minute intervals a maximum of 5 times.
1010	ABORT	The CDR link has been busied out to out-of-service. **1** Enter the **release cdr-link** command to release the CDR link from busyout state. **2** Retry the **test cdr-link long** command to execute the test.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals a maximum of 5 times.
	PASS	The CDR link has been put in a DOWN state. CDR records are still recorded in an internal buffer but S8100 will not write to the cdr.out file. Test 215 is used to put the logical link into an UP state.

Link Retry Test (#215)

This test sets the state of the CDR link to UP if the cdr.out file is not full and to DOWN if the cdr.out file is full. The cdr.out file is used to record CDR records on S8100. The file will not get full if CAS system is periodically retrieving and deleting the cas.in file so that S8100 can rename the cdr.out file to cas.in.

Table 253: TEST #215 Link Retry Test

Error Code	Test Result	Description/ Recommendation
10	ABORT	Internal system error
20	ABORT	Internal system error. Internal error in Maintenance Action Process (MAP). MAP returns an error back to maintenance script (HMM). Timer expires while waiting for the reply from MAP. **1** Retry the command at 1-minute intervals a maximum of 5 times.
30	ABORT	Internal system error **1** Refer to Procedures for Restoring the CDR Link on page 594.
1010	ABORT	The CDR link has been busied out to out-of-service. **1** Enter **release cdr** command to release the CDR link from busyout state. **2** Retry **test cdr-link** command to execute the test.
	FAIL	The cdr.out file on S8100 is full since CAS is not retrieving call records from S8100. S8100 may still be storing CDR records in an internal buffer but it has stopped writing data to the cdr.out file. The cdr.out file on S8100 is periodically renamed as the cas.in file on S8100 to allow CAS software to retrieve the CDR records. The CAS software runs on a separate PC which maps the directory containing the cas.in file on S8100 to a drive letter on the PC. If CAS does not read and delete the cas.in file every few minutes, the cdr.out file may reach its maximum size which causes an alarm to be generated. The Link Retry test will fail when the cdr.out file is full. **1** Refer to the Procedures for Restoring the CDR Link on page 594 for instructions.
	PASS	The CDR link is up. CAS is reading and deleting the cas.in file on S8100 on a periodic basis so S8100 is able to move the cdr.out file to the cas.in file and continue writing new CDR records to the cdr.out file.

CLAN-BD (Control LAN Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CLAN-BD	MINOR	**test board *location* long**	Control LAN circuit pack
CLAN-BD	WARNING	**test board *location* short**	Control LAN circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

Control LAN circuit pack

The TN799 Control LAN (C-LAN) packet port circuit pack provides TCP/IP connection to adjunct applications such as CMS, Intuity, and DCS Networking. The C-LAN circuit pack has one 10baseT Ethernet connection and up to 16 DS0 physical interfaces for PPP connections. C-LAN also extends ISDN capabilities to csi models by providing packet-bus access.

An RSCL (remote socket control link) links the C-LAN and the server to pass call- control and other management information. Because one link serves every port on the circuit pack, maintenance of the RSCL is part of the C-LAN circuit-pack maintenance.

The TN799 C-LAN circuit pack combines the functions of the PGATE and PI circuit packs into one circuit pack. Use a PGATE or PI with a C-LAN to create an X.25-to-TCP/IP bridge for adjunct and DCS connectivity.

C-LAN socket load balancing

Prior to Communication Manager Release 2.0, IP endpoints registered to C-LANs (TN799x) on a round-robin algorithm — an IP endpoint registers to the next available C-LAN within a list of available C-LANs. In a system with two or more C-LANs, this distribution method can result in one C-LAN controlling the majority of IP endpoints. This skewed distribution of endpoints among available C-LANs results in a vulnerability to a higher loss of telephony resources in the event of a C-LAN failure than if the IP endpoints were more uniformly distributed across the available C-LANs.

With Communication Manager Release 2.0, a new feature provides for a more uniform balancing of the load across the available C-LANs. With this feature, an IP endpoint registers to the C-LAN with ***the least number of used sockets*** (regardless of the number of available sockets). This will apply to the following IP endpoints:

- H.245, H.248, and H.323 signaling groups
- H.323 stations
- SIP endpoints

Socket counts will include H.245 and H.248 endpoints but the load-balancing algorithm will not be used for registering these endpoints. Sockets used by adjuncts will not be included in the socket count.

> **NOTE:**
> This allocation is performed for the C-LANs assigned within each network region, independently of the C-LANs assigned to other network regions.

A new field, `Number of CLAN Sockets Before Warning`, has been added to the ***ip-interfaces*** form. The system logs a warning to the hardware error log when a TN799x circuit pack has reached the socket usage specified in this field. The warning can be viewed using the **display errors** command.

> **NOTE:**
> IP endpoints can still register to this circuit pack after the warning has been issued.

The presence of the warning in the error log indicates that the customer needs to look at the network configuration. The **status clan-usage** command displays socket usage for C-LAN circuit packs in a system. This allows the customer to verify that IP endpoint registration has been evenly distributed, or to determine whether additional TN799x circuit packs are needed.

Also, even though all CLANs may be available, all endpoints are configured to be in a few specific network regions, and may possibly be overloading the CLANs in those network regions. This would indicate that additional capacity is required in the affected network regions, or that network configuration and administration needs to be altered to make it more balanced. Additional C-LANs can be administered, or existing administration of C-LANs can be changed using the **add/change ip-interfaces** commands (see *Maintenance Commands Reference (555-245-101)* for details).

> **NOTE:**
> When a TN799x is replaced or added, re-balancing does not occur. That is, the system does not un-register an IP endpoint for the purpose of load balancing. Replaced or added TN799x circuit packs will be detected as the least-used C-LANs, and IP endpoints will register with them until the socket load is evenly balanced.

C-LAN congestion controls

The switch activates congestion controls on a C-LAN when it detects a buffer exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffers have returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval,	Raises MINOR alarm.
Exhausts buffers,	Raises MINOR alarm.
Ceases for 12 minutes,	Retires MINOR alarm.

Error Log Entries and Test to Clear Values

Table 254: CLAN-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)	0		MINOR	ON	
18 (b)	0		WARNING	OFF	**release board** *UUCSS*
217 (c)	0	None	WARNING	ON	
257	65535	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **l r 20**
257 (d)					
513 (e)	4352-4357		MINOR	ON	
769 (f)	4358				
1293 to 1297 (g)	Any		MINOR	ON	**reset board *UUCSS***
1537(h)	Any		MINOR	ON	
1794 (i)			MINOR	ON	
1797 (j)					
1798 (j)					
2049 (k)		Packet Interface test (#598)	MINOR	ON	**test board** *UUCSS* **l r 3**
2305 2306 (l)					
2561 to 2668 (m)	Any				
2817 2819 (n)		Congestion Query test (#600)	MINOR	ON	**test board** *UUCSS* **s r 3**
2820 (ad)			WARNING	OFF	
3073 (o)		Link Status test (#601)	MINOR	ON	**test board** *UUCSS* **s**
3330 (p)			MINOR	ON	**reset board** *UUCSS*
3586 (q)					
3999 (q)	Any	None			
3840 (r)	4096-4102				
3841 3843 (s)					
3842 (t)					

Table 254: CLAN-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3844 (u)	Any				
3845 (v)	Any				
3846 (w)	Any				
3848 (x)	Any				
3849 (y)	Any				
3850-3861 (z)	Any				
3862 (aa)	Any				
3865 (ab)	Any				
3866 (ac)	Any				

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Notes:

a **Error Type 1**: Circuit pack stopped functioning or is not physically present.

1 Verify that the circuit pack is present.

2 If circuit pack is present, reset the circuit pack (**reset board *UUCSS***).

3 If the error persists, replace the circuit pack.

b **Error Type 18**: The C-LAN circuit pack busied out.

c **Error Type 217**: applies to 10 circuit packs:

1 Remove the circuit pack(s) against which the error is logged.

d **Error Type 257**: Transient communication problem between switch and circuit pack; does not affect service and can be ignored.

1 Ignore this error, unless the Control Channel Loop Test (#52) fails.

2 If Test #52 fails, replace the circuit pack.

Repetitive failures of the Control Channel Loop test indicate circuit pack hardware failure.

e **Error Type 513**: Circuit pack detected and reported hardware failure.

1 Reset the circuit pack (**reset board *UUCSS*).**

Aux Data:

4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4356	Angel Message Corruption error
4357	Instruction set error

f **Error Type 769**: Logic error. By itself this error may be ignored, but it may result in other error types being reported.

g **Error Type 1293-1297**: Critical hardware or firmware error.

If the switch detects:	Then the switch:
1 error,	Resets circuit pack.
3 errors in 15 minutes,	Raises MINOR alarm.

Error Type descriptions are as follows:

1293	Insane onboard processor
1294	Onboard translation RAM error
1295	(Aux 3) RSCL link down
	Software requested a reset of the CLAN because it failed to get a keep-alive response from the CLAN for over a minute.
	(Aux 0) RSCL keep alive failure
1296	Software requested a reset of the CLAN.
1297	Software requested a reset of the CLAN

1. Attempt to clear the alarm (**reset board *UUCSS***).
2. If alarm persists, replace circuit pack.

h **Error Type 1537**: Switch removed hyperactive circuit pack that reported threshold number of errors.

1. Attempt to clear the alarm (**reset board *UUCSS***).
2. If the error recurs within 15 minutes, replace the circuit pack.

i **Error Type 1794**: Packet-bus transmit buffers have overflowed.

1. Attempt to clear the alarm (**reset board *UUCSS***).
2. If the error recurs within 15 minutes, replace the circuit pack.

Error Type 1797: Invalid layer 2 frame received.

j **Error Type 1798**: Unable to write translation RAM.

1. Attempt to clear alarm (**reset board *UUCSS***).
2. If alarm recurs within 15 minutes, replace the circuit pack.

k **Error Type 2049**: Packet Interface test (#598) failed.

1. Attempt to clear the alarm (**test board *UUCSS* l r 3**).
2. If alarm does not clear, reset the circuit pack (**reset board *UUCSS***).
3. If circuit pack resets, execute Packet Interface test (#598) several times.
4. If Packet Interface test (#598) continues to fail, replace the circuit pack.

l **Error Type 2305-2306**: Error in received frame from packet bus.

Error Type:	Description
2305	Received invalid LAPD frame.
2306	Detected parity error on received frame.

Most likely cause — packet-bus problem
Other cause — circuit-pack fault

Invalid LAPD frame errors occur when the frame

- contains a bad Cyclic Redundancy Check (CRC),
- is greater than the maximum length,
- violates the link level protocol.

1 Retry the command (**test board *UUCSS***) and see if the condition clears.

2 If condition persists, execute PPE/LANBIC Receive Parity Error Counter test (#597), and determine whether the condition clears.

3 If condition persists, execute Packet Interface test (#598) to verify circuit pack integrity.

4 If Packet Interface test (#598) fails, consult repair procedure for the packet bus.

m **Error Type 2561-2668:** System software received an indication that the socket was closed due to an error. Errors are reported as log only. Errors logged here are for the sockets that had *no* processor channels associated with them, for example, sockets to read SNMP data. The counter base is offset by the application type of the application associated with this socket that is down. The Aux Data field of the log entry contains this application's number, for example, a SNMP application would have its application number in the Aux Data field.

NOTE:
2561 - 2668 is a range of reserved numbers for future applications. 2570 currently represents an SNMP socket failure.

n **Error Type 2817-2819**: Congestion Query test (#600) failed.

The Error Types correspond to the descriptions:

2817	All buffers exhausted.
2819	Utilized buffers exceed threshold.

If:	Then:
Active buffers exceed threshold	C-LAN enters congested state.

1 Refer to Congestion Query test (#600) for Abort and Fail codes 3601.

o **Error Type 3073**: RSCL (Remote Socket Control Link) or Link Status test (#601) failed. This failure may be due to:

- This circuit pack
- The packet bus

- The Packet Interface circuit pack.

If:	Then:
RSCL disconnects at link level	Link fails
Link cannot be reconnected quickly	Switch raises MINOR alarm

p **Error Type 3330**: Critical failure in packet-bus interface.

Below, Error Types correspond to descriptions.

If the switch detects:	Then it:
1 error,	Resets circuit pack.
2 errors in 15 minutes,	Raises MINOR alarm.

1 Attempt to clear the alarm (**reset board *UUCSS***).

2 If alarm persists, replace circuit pack.

q **Error Type 3586 and 3999**: Switch removed hyperactive circuit pack that reported threshold number of errors. One or more of the following symptoms may be present:

- Circuit pack port tests return `NO BOARD`.
- List configuration command shows circuit pack and ports are installed properly

If Error Type 3999:	And traffic volume is:	Then:
Does not accompany Error Type 3586,	Heavy	Circuit pack is in service, but sent at least half hyperactive threshold. With heavy traffic, this is normal.
Does not accompany Error Type 3586,	Light	Circuit pack is in service, but sent at least half hyperactive threshold. With light traffic, this error indicates a problem with the circuit pack, its links, or the equipment attached to the links.
Accompanies Error Type 3586,	Either Light or Heavy	Switch removed hyperactive circuit pack.

1 Busyout **(busyout board *UUCSS*)** and release (**release board *UUCSS***) circuit pack

2 Allow 30 minutes for condition to clear itself.

3 To re-establish circuit pack into service manually, busyout (**busyout board *UUCSS***), reset (**reset board *UUCSS***), and release (**release board *UUCSS***) the circuit pack.

4 If error recurs within 15 minutes, replace the circuit pack.

5 If the same error occurs on a different circuit pack, follow normal escalation procedures.

r **Error Type 3840**: Circuit pack received bad control channel message from switch.

Aux Data:

4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link
4102	Bad application identifier

s **Error Type 3841-3843**: errors do not affect service.

Below, Error Types correspond to descriptions.

3841	Internal firmware error.
3843	Bad translation RAM. Call uses another translation location.

These errors do not affect service, however, they may cause reports of other errors that do affect service.

If Error Type 3843 begins to affect service, it escalates to Error Type 1294.

t **Error Type 3842**: Packet interface receive buffers overflowed.

If this error occurs frequently, the overflow may be congesting the circuit pack.

1 Refer to Receive FIFO Overflow Error Counter test (#596).

u **Error Type 3844**: LAPD frame contains LAPD protocol error.

By themselves, these errors do not affect service.

v **Error Type 3845**: Angel interprocessor error.

By themselves, these errors do not affect service.

w **Error Type 3846**: High CPU occupancy.

By themselves, these errors do not affect service.

x **Error Type 3848**: Interprocessor LAPD protocol error.

By themselves, these errors do not affect service.

y **Error Type 3849**: Interprocessor LAPD frame error.

By themselves, these errors do not affect service.

z **Error Type 3850 - 3861**: IBL error.

By themselves, these errors do not affect service. These errors can occur only on a G3csi machine that has an Interboard Link (IBL).

aa **Error Type 3862**: Memory allocation failure.

By themselves, these errors do not affect service.

ab **Error Type 3865**: **S8700** / **S8500**: CLAN DLCI audit action has removed CIP only DLCIs. By themselves, these errors do not affect service.

ac **Error Type 3866**: **S8700** / **S8500**: CLAN DLCI audit action has removed CLAN only DLCIs. By themselves, these errors do not affect service.

ad **Error Type 2820:** A threshold number of sockets in use for IP endpoint registration per C-LAN can be administered by the customer. When the threshold is reached, a warning message is logged, but IP endpoints can still register with that C-LAN if it has additional sockets available. The warning can be viewed using the **display errors** command.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order they appear in the table below.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-Around test (#52)	X	X	ND
Circuit Pack Restart test (#252)			D
Invalid LAPD Frame Error Counter test (#597)		X	ND
PPE/LANBIC Receive Parity Error Counter test (#595)		X	ND
Receive FIFO Overflow Error Counter test (#596)		X	ND
Packet Interface test (#598)	X	X	ND
Congestion Query test (#600)	X	X	ND
Link Status test (#601)	X	X	ND

1 D = Destructive; ND = Nondestructive

Control Channel Loop-Around Test (#52)

This nondestructive test fails if the circuit pack does not return to a sane state after being reset. This test queries the circuit pack for its code and vintage, and verifies its records.

Table 255: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
	FAIL	The circuit pack failed to return the code or vintage. **1** Retry command at 1-minute intervals up to 5 times. **2** Reset the board (**reset board *UUCSS***). **3** If reset aborts with error code 1115, busyout (**busyout board *UUCSS***), reset (**reset board *UUCSS***), and release board (**release board *UUCSS***). **4** If test continues to fail, replace the circuit pack. **5** Escalate the problem if failures continue.
	PASS	Test successful.

Circuit Pack Restart Test (#252)

This test is **destructive**.

Execute this test (not part of either short or long demand test sequence) to reset the circuit pack only if there are PPCPU errors. This test fails if the circuit pack does not return to a sane state after being reset. The circuit pack resets through the SAKI Sanity test (#53).

Table 256: Test #252 Circuit Pack Restart Test

Error Code	Test Result	Description / Recommendation
None	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack (**busyout board *UUCSS***). **2** Retry the command at 1-minute intervals up to 5 times. **3** If the problem persists, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.

1 of 2

Table 256: Test #252 Circuit Pack Restart Test

Error Code	Test Result	Description / Recommendation
1, 2	FAIL	The circuit pack failed to reset. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, pull out and reseat the circuit pack. **3** If the problem persists, replace the circuit pack.
	PASS	The circuit pack initialized correctly.

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PPE/LANBIC Receive Parity Error Counter Test (#595)

This test is nondestructive. When the C-LAN circuit pack detects a parity error with a received frame, it increments the PPE/LANBIC Receive Parity error counter. This test reads and clears the counter, and may verify repair of problem.

Errors may indicate a problem with:

- This circuit pack
- A packet bus
- Another circuit pack on the bus

Table 257: Test #595 PPE/LANBIC Receive Parity Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.

1 of 2

Table 257: Test #595 PPE/LANBIC Receive Parity Error Counter Test

Error Code	Test Result	Description / Recommendation
1–10	FAIL	Circuit pack detects parity errors. The Error Code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute Packet Interface test (#598) (**test board *UUCSS***). **3** If Packet Interface test (#598) fails, see packet-bus repair procedures.
	PASS	Circuit pack detects no errors.

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Receive FIFO Overflow Error Counter Test (#596)

This test is nondestructive. When the C-LAN circuit pack detects packet-bus buffer overflow, it increments the error on the FIFO Overflow error counter. This test reads and clears the counter.

If errors are:	Then they may be due to:
Occasional	Statistical buffer sizing
Persistent	Circuit pack congestion that requires redistribution of traffic load

Table 258: Test #596 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.

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Table 258: Test #596 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
1–10	FAIL	Circuit pack detects overflow errors. The error code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute Packet Interface Test #598 (**test board *UUCSS***). **3** If Packet Interface Test #598 fails, see PKT-BUS (Packet Bus) on page 1406 for repair procedures.
	PASS	Circuit pack detects no errors.

Invalid LAPD Frame Error Counter Test (#597)

This test is nondestructive.

A C-LAN detects an invalid frame when it receives:

- a frame with a CRC error
- an unrecognizable frame
- a recognizable frame in an unexpected state

When the C-LAN circuit pack detects an invalid LAPD frame, it increments the Invalid LAPD Frame error counter. This test reads and clears the counter, and verifies the repair of the problem.

Errors may indicate a:

- circuit-pack problem
- packet-bus problem
- problem with another circuit pack on the bus

Table 259: Test #597 Invalid LAPD Frame Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.

Table 259: Test #597 Invalid LAPD Frame Error Counter Test

Error Code	Test Result	Description / Recommendation
1–10	FAIL	The circuit pack detects LAPD frame errors. The error code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute the Packet Interface test (#598) (**test board *UUCSS* long**). **3** If the Packet Interface test (#598) fails, see PKT-BUS (Packet Bus) on page 1406 for repair procedures.
	PASS	Circuit pack detects no errors.

Packet Interface Test (#598)

This nondestructive test checks the packet-bus interface circuitry on the C-LAN circuit pack. Test failure indicates faulty circuit pack.

Table 260: Test #598 Packet Interface Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2012	ABORT	Could not allocate the necessary system resources to run test.
2100	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
	FAIL	Circuit pack has detected a failure of Packet Interface Test #598. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the test continues to fail, replace the circuit pack.
	PASS	Packet Interface Test #598 passed.

Congestion Query Test (#600)

This nondestructive test queries the number of used buffers to determine whether the C-LAN circuit pack is congested.

If:	Then:
Used buffers are, or are nearly, exhausted	The test fails
The test fails	The switch redirects outgoing calls to another available C-LAN, and denies new incoming calls

Normal call handling resumes when the C-LAN circuit pack has recovered from congestion.

Table 261: Test #600 Congestion Query Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2012	ABORT	Could not allocate the necessary system resources to run test.
2100	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1, 2	FAIL FAIL	The buffer level is nearly exhausted. The C-LAN is congested, and no buffers are available. **1** Retry command at 1-minute intervals up to 5 times. **2** If command continues to fail, examine the C-LAN port measurements to determine what ports are heavily utilized and the processor occupancy of the circuit pack. *Low processor occupancy* when C-LAN congested indicates circuit pack failure. **1** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **2** If congestion recurs, replace the circuit pack. *High processor occupancy* indicates the C-LAN is congested due to traffic load. **1** To relieve congestion in the short term, selectively busyout ports (**busyout port *UUcSSpp***) on the Control LAN circuit pack. **2** To achieve a more permanent resolution, it may be necessary to move ports on this circuit pack to other Control LAN circuit packs. **3** Consider replacing affected C-LAN ports with new ports.

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Table 261: Test #600 Congestion Query Test

Error Code	Test Result	Description / Recommendation
3	FAIL	The C-LAN circuit pack is not operating normally and is congested.
	PASS	Hardware setting and attached cable type match C-LAN circuit pack administration. The circuit pack detects no errors.

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Link Status Test (#601)

This nondestructive test determines the state of the call-control signaling link for Control LANs. If the signaling link is physically connected, the test sends a test frame over the link and checks for a response. The test passes only if both the signaling link is connected and the test frame is successfully transmitted.

A failure may indicate a problem with:

- this circuit pack
- the packet bus
- the Packet Interface circuit pack

Table 262: Test #601 Link Status Test

Error Code	Test Result	Description / Recommendation
1125	ABORT	RSCL link or C-LAN board not in service. **1** Release the board. **2** Repeat the test. **3** Escalate if the problem persists.
2012	ABORT	Could not allocate the necessary system resources to run this test.
2100	ABORT	Internal system error. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
2	FAIL	The RSCL control link disconnected. **1** Retry command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute Packet Interface test (#598) (**test board *UUCSS***) to determine if the problem is due to the circuit pack. **3** If Packet Interface test (#598) fails, see PKT-BUS (Packet Bus) on page 1406 for repair procedures. **4** If Packet Interface test (#598) passes, refer to Packet Control circuit pack and packet-bus repair procedures.

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Table 262: Test #601 Link Status Test

Error Code	Test Result	Description / Recommendation
3	FAIL	Received no response to RSCL control link test frame. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If test continues to fail, replace the circuit pack.
	PASS	RSCL control link connected.

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CLSFY-BD (Call Classifier Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CLSFY-BD	MINOR	**test board *location* sh**	Call Classifier circuit pack
CLSFY-BD	WARNING	**test board *location* sh**	Call Classifier circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors.
See also CLSFY-PT (Call Classifier Port) on page 617 for related port information.

CLSFY-PT (Call Classifier Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CLSFY-PT[1]	MAJOR	**test port *location* sh**	Call Classifier Port
CLSFY-PT	MINOR	**test port *location* sh**	Call Classifier Port
CLSFY-PT	WARNING	**test port *location* sh**	Call Classifier Port

1 For information on specifying a location, see Command Syntax on page 179.

The TN744 Call Classifier is a service circuit pack that provides specialized tone detection capabilities to support the Outbound Call Management (OCM) and Inbound Call Management (ICM) features. The TN744 supports both A-law and Mu-law companding.

The TN744 has eight ports (CLSFY-PTs), each capable of supporting call classification, touch-tone reception and MFC-tone generation and detection. The CLSFY-PT MO implements a set of tests designed to ensure proper operation of the Call Classifier.

NOTE:
S8100: A TN744D Call Classifier/Tone Detector circuit pack may be required in systems with heavy traffic. This circuit pack can be installed into any slot, although slot 3 of Cabinet A is preferred.

Error Log Entries and Test to Clear Values

Table 263: Call Classifier Port (CLSFY-PT) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1	any	Tone Detector Audit/Update test (#43)	MAJOR/ MINOR (a)	ON	**test port** *UUCSSpp* **r 2**
18		**busyout port**	WARNING	OFF	**release port** *UUCSSpp*
257 (b)	17666	Tone Detection Audit Update test (#43)	MAJOR/ MINOR (a)	ON	**test port** *UUCSSpp* **r 3**
513 (c)	any	Tone Detection Verification test (#42)	MAJOR/ MINOR (a)	ON	**test port** *UUCSSpp* **r 3**

Notes:

a There are two possible alarm levels for this error type: MAJOR and MINOR. A major alarm is raised if the total number of call classifier ports currently in-service is less than or equal to 1/2 of the administered threshold number. Otherwise, a minor alarm is raised. In either case, run the short test sequence on the alarmed port and follow the error code procedures for the individual tests.

The in-service threshold number for alarming call classifier ports is administered using the **change system-parameters maintenance** command. For details, see Chapter 1, "Maintenance SAT Commands" in *Maintenance Commands Reference (555-245-101)*.

1. Issue these commands in order: **busyout board**, **reset board**, **release board**. The board reset is required to reload on-board RAM associated with the TN744's DSPs. This takes all 8 Tone Detector ports out of service for a few seconds. Only 4 of the 8 would be out of service due to the alarm. (There are five Tone Detectors on each of the two DSPs.) Other than the unlikely potential of running out of Tone Detector resources in the switch, there is no other effect when the board is reset.
2. Test the board (**test board *UUCSS* long**).
3. If the test still fails, replace the board.

b The CLSFY-PT lost its translation. Testing the CLSFY-PT is sufficient to reload its translation. If testing the call classifier port does not clear the error, then the call classifier circuit pack containing the defective call classifier port should be replaced.

c This error indicates the call classifier port is having problems detecting call classification tones or detecting and generating R2-MFC tones This is usually accompanied by failures of some incoming or outgoing calls. If this error type is persistently logged, then replace the call classifier circuit pack containing the defective CLSFY-PT.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables. For example, by clearing error codes associated with the *Tone Detection Verification* test (#42), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification test (#42)	X	X	ND
Tone Detection Audit/Update test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test checks the operation of the TN744 in touch-tone receiver, call classifier and R2-MFC modes. It verifies the circuit pack's ability to detect DTMF, ring back, busy reorder and modem answer tones and to generate and detect forward and backward MFC tones.

Table 264: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
none	ABORT	The system was not able to allocate every resource needed for this test, OR there was an internal system error.
1	ABORT	The system could not allocate every resource needed to test the tones.

Table 264: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	The system was unable to put the call classifier port in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This situation could occur when the system is heavily loaded. If the system is not heavily loaded, use **test tdm** to test the TDM-BUS. **1** Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a Tone-Clock for the test connection. This may be caused by a heavy load on the system or by a faulted Tone-Clock. **1** Check to see if there are any alarms against the Tone-Clock in the PN where the test aborted. If so, see TONE-BD (Tone-Clock Circuit) on page 1902 and TONE-PT (Tone Generator) on page 1927 for recommended procedures. **2** If a new Tone-Clock has been inserted, allow about 1-minute for maintenance to run on the newly inserted circuit pack. **3** Retry the command at 1-minute intervals up to 5 times.
S8100: 1003	ABORT	The system could not allocate a Tone-Clock circuit pack for the test connection. This situation could occur when the system is heavily loaded or if a Tone-Clock circuit pack is not present in the port network when this test is executed. **1** Verify the existence of a Tone-Clock circuit pack in the same port network. **2** If a Tone-Clock circuit pack is missing, install one in the same port network. **3** Allow approximately 1 minute for the Tone-Clock circuit pack maintenance to run on the newly inserted Tone-Clock circuit pack. **4** Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Call classifier circuit pack's response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 264: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
2006	ABORT	Indicates that the active Tone-Clock circuit pack or a Tone Detector circuit pack may not be functioning properly. **S8100**: If there is more than one Tone Detector circuit pack in the system, then the problem can be either with the Tone-Clock circuit pack or the Tone Detector circuit pack. This could also be caused by the mode administered for the system not matching that of the Tone Detector circuit pack. **1** **S8100**: Verify the existence of a Tone-Clock circuit pack in the same port network. **2** **S8100**: If a Tone-Clock circuit pack is missing, install one in the same port network. **1** Test the *active* Tone-Clock circuit pack in the PN with **test tone-clock *UUC***. See TONE-BD (Tone-Clock Circuit) on page 1902 for failures. **2** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1-3	FAIL	DTMF digits were not detected correctly. This may or may not impact reception of R2-MFC calls. **1** Run the short test sequence via the **test port *UUCSSpp* sh r 1** command. **2** If the problem persists, the system is still operating properly but capacity will be reduced. To restore performance to normal, replace the call classifier circuit pack containing the defective CLSFY-PT (Call Classifier Port).
S8700 S8500: 102	FAIL	2225-Hz Modem Answer tone was not detected correctly. This will impact call-classification operation. **1** Run the short test sequence via the **test port *UUCSSpp* sh r 1** command. **2** If the problem persists, the system can still operate properly but capacity will be reduced. In order to restore performance to normal, replace the call classifier circuit pack containing the defective port.
130 **S8100**: 101-122	FAIL	Forward or backward R2-MFC signals were not correctly generated or detected. This will impact R2-MFC calls. **1** Run the short test sequence via the **test port *UUCSSpp* sh r 1** command. **2** If the problem persists, the system can still operate properly but capacity will be reduced. In order to restore performance to normal, replace the call classifier circuit pack containing the defective port.
	PASS	Tone detection verification is successful. The call classifier port is able to detect and generate every necessary tone.

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Tone Detector Audit/Update Test (#43)

This test performs a sanity audit on the CLSFY-PT (Call Classifier Port).

Table 265: Test #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description / Recommendation
none	ABORT	The system was not able to allocate the resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Hardware audit failed. **1** Issue these commands in order: **busyout board**, **reset board**, **release board**. The board reset is required to reload on-board RAM associated with the TN744's DSPs. This takes all 8 Tone Detector ports out of service for a few seconds. Only 4 of the 8 would be out of service due to the alarm. (There are five Tone Detectors on each of the two DSPs.) Other than the unlikely potential of running out of Tone Detector resources in the switch, there is no other effect when the board is reset. **2** Test the board (**test board *UUCSS* long**). **3** If the test still fails, replace the board.
	PASS	The call classifier port has passed the sanity inquiry.

CO-BD (Central Office Trunk Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CO-BD	MINOR	**test board *location* sh**	Central Office Trunk circuit pack
CO-BD	WARNING	**test board *location* sh**	Central Office Trunk circuit pack

1 For information on specifying a location, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors.
See also CO-TRK (Analog CO Trunk) on page 639 for related trunk information.

CO-DS1 (DS1 CO Trunk)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
CO-DS1	MAJOR[1]	**test trunk *group#/member#* l**	DS1 CO Trunk
CO-DS1	MINOR	**test trunk *group#/member#* l**	DS1 CO Trunk
CO-DS1	WARNING	**test trunk *group#/member#***	DS1 CO Trunk

1 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed. For more information about the **set options** command, see *Maintenance Commands Reference (555-245-101)*.

Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *"Chapter 12, Managing Trunks"*, in the *Administrator's Guide for Avaya™ Communication Manager, 555-233-506* for information on how to administer trunks. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

A DS1 CO (central office) trunk provides a link for digitized voice or data communications between the system and a central office switch. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

  32-channel mode is supported on the TN464, TN2207, and TN2464 circuit packs (**S8300**/**G700**: and on MM710 Media Modules).

The DS1-CO MO monitors and maintains a CO trunk port on a TN767 DS1 Interface circuit pack, a TN464 UDS1 Interface circuit pack, (**S8300** / **G700**: or MM710 Media Module). Throughout this discussion, the term DS1 applies to all. For more information, see one of the following maintenance objects:

Circuit Pack/Media Module	Maintenance Object
TN767 DS1 Interface Circuit Pack	DS1-BD
TN464 UDS1 Interface Circuit Pack	UDS1-BD
S8300 / **G700**: MM710 DS1 Media Module	MG-DS1

The DS1 circuit pack or media module supports low level CO trunk signaling interfaces for both ground-start and loop-start trunks. This maintenance strategy covers the in-line errors log, initialization tests, periodic tests, scheduled tests, demand tests, and alarm resolution.

S8300 / **G700**

The MM710 supports T1/E1, and delivers the same functionality as the TN464 circuit pack. Although the CO-DS1 MO is provided for G700/G350 Media Gateways, this MO only partially supports the MM710 DS1 Media Module.

Three trunk service states are specified by DS1 CO trunk maintenance:

out-of-service	The trunk is in a deactivated state and cannot be used for either incoming or outgoing calls.
in-service	The trunk is in an activated state and can be used for both incoming and outgoing calls.
disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

Error Log Entries and Test to Clear Values

Table 266: DS1 CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
0 +	0	Any	Any	Any	**test trunk** *grp/mbr*
1 +	57408				
1 +	57487				
15 +	Any	Port Audit and Update test (#36)			
18 +	0	**busyout trunk** *grp/mbr*	WARNING	OFF	**release trunk** *grp/mbr*
130 +		None	WARNING	ON	**test trunk** *grp/mbr*
257 +	57392	DS1 CO Dial Tone Seizure test (#314) **For G700:** Aborts with Error Code 1412	MINOR WARNING	OFF	
513 +	57393	DS1 CO Dial Tone Seizure test (#314 **For G700:** Aborts with Error Code 1412	MINOR WARNING	OFF	
769 +	57484				

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Table 266: DS1 CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
1025		DS1 CO Dial Tone Seizure test (#314) **For G700:** Aborts with Error Code 1412	MINOR WARNING [2]	OFF	**test trunk** *grp/mbr* **r 2**
1281		Conference Circuit test (#7) **For G700:** Aborts with Error Code 1412		ON	**test trunk** *grp/mbr* **l r 4**
1537		NPE Crosstalk test (#6) **For G700:** Aborts with Error Code 1412		ON	**test trunk** *grp/mbr* **l r 3**
1793 +					**test board** <***location***> **l**[3]
2562 +	16665				
2817 +	52992				
3840 +		Port Audit and Update test (#36)			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major alarms MO may be downgraded to Warning alarms based on the value used in the set options command.

3 For information on specifying a location, see Command Syntax on page 179.

+ Additional Information About Error Types:

Error Type 1: Aux Data 57408—No tip ground is detected on an outgoing call.
Aux Data 57487—PBX could not get "loop close" signal.

If the error occurred on a port of a TN767 DS1 or TN464 UDS1 Interface circuit pack, the circuit pack detected a hardware fault. These errors will cause Dial Tone Test #314 to run and are only considered a problem if the Dial Tone test fails (in which case Error Type 1025 will also show up). In this case, the trunk may be put in the ready-for-service state (shown as "disconnected" by the status command), which allows only incoming calls. Run Dial Tone Test #314, and follow the procedures.

S8300 / **G700**: If the error occurred on a port of an MM710 DS1 Media Module, Test #314 will abort with Error Code 1412. Escalate the problem.

Error Type 15: This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors (if any).

Error Type 18: System Technician has busied out the trunk to the out-of-service state. No calls can be made on this trunk except Facility Access Test Calls.

Error Type 130: This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 257: The DS1 Interface circuit pack detects a hardware fault. Aux Data 57392 indicates no external release on PBX disconnect. This alarm will only be raised when the System-Parameter Country screen has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

S8300 / **G700**: On an MM710 DS1 Media Module, Associated Test #314 will abort with Error Code 1412. Escalate the problem.

Error Type 513: The DS1 Interface circuit pack detects a hardware fault. Aux Data 57393 indicates belated external release on PBX disconnect. This alarm will only be raised when the System-Parameter Country screen has the Base Tone Generator field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

S8300 / **G700**: On an MM710 DS1 Media Module, Associated Test #314 will abort with Error Code 1412. Escalate the problem.

Error Type 769: The DS1 Interface circuit pack or media module detects a hardware fault. The Aux Data contains the following error type:—57484, fault is detected on tip/ring.

Error Type 1793: DS1 Interface circuit pack or media module is out-of-service. Look in the Hardware Error Log:

If port is on	Look in
TN767 DS1 Board	DS1-BD
TN464 UDS1 Board	UDS1-BD
S8300 / **G700**: MM710 DS1 Media Module	MG-DS1

Error Type 2562: Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

Error Type 2817: Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and far ends. Attempt to place the call again. If the error persists, execute the Dial Tone Seizure test (#314), and follow those procedures.

S8300 / **G700**: If the error occurred on a port of an MM710 DS1 Media Module, Test #314 will abort with Error Code 1412. Escalate the problem.

Error Type 3840: Port Audit and Update test (#36) failed due to an internal system error. Enter the **status trunk** command to verify the status of the trunk. If the trunk is out-of-service, then enter the **release trunk** command to put it back into in-service. Retry the test command.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *NPE Crosstalk* test (#6), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8300** / **G700:** Aborts with Error Code 1412.		X	ND
Conference Circuit test (#7) **S8300** / **G700:** Aborts with Error Code 1412.		X	ND
DS1 CO Trunk Seizure test (#314) **S8300** / **G700:** Aborts with Error Code 1412.	X	X	ND
Port Audit and Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 267: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. The **status health** command can be used to determine whether the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Issue **list measurements tone-receiver** to display information about the system's tone receivers. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.

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Table 267: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors was found on the DS1 circuit pack: Loss of signal (1281), Blue alarm (1793), Red alarm (2049), Yellow alarm (2305), or Hyperactivity (1537). **1** Look for the previous error types in the Hardware Error Log, and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.
	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive. **1** Verify that the board's translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, use **busyout board <*address*>**. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted. **NOTE:** Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after issuing **list config** but the `Vintage` field reports that there is no board (when there really is a board), then **busyout board** and **release board** do not work, but the **reset board <*address*>** command does work. The software puts the hyperactive board back in service after the hyperactivity clears.

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Conference Circuit Test (#7)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 268: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	The test was aborted. System resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some of the Tone Detectors may be out of service. **1** Issue the **list measurements tone-receiver** command to display basic information about the system's tone receivers. **2** Resolve any TTR-LEV errors. **3** Resolve any TONE-PT errors. **4** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. **1** Use **status station** or **status trunk** to determine when the port is available for testing. **2** Retry the command at 1-minute intervals up to 5 times.

Table 268: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	The test was disabled via translation. You may want to determine why the test has been disabled before you enable it. **1** Verify that the `Maintenance Test` field on the **Trunk Administration** form is set to **n**. To enable the test, change the trunk administration and enter **y** into the `Maintenance Test` field. **2** Repeat the test.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
1412	ABORT	This test does not execute on a G700/G350 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors was found on the DS1 circuit pack: Loss of signal (1281), Blue alarm (1793), Red alarm (2049), Yellow alarm (2305), or Hyperactivity (1537). Look for the previous error types in the Hardware Error Log, and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 268: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. **1** Enter the **list configuration board <*address*>** command. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. The error log may have error type 1281 entries. **2** Test every administered trunk on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. **3** If every port fails, check CARR-POW MO (**S8700 IP**: RMC-ENV MO) . **4** If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. **5** If the retry passes and troubles have been reported, coordinate isolation with the CO. Make sure that the switch, the CO, and any NTCE equipment (the CSI's) have the correct administration. **6** Replace the circuit pack. **NOTE:** If the conference circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. To investigate problems with a power unit, see the CARR-POW (Carrier Power Supply) MO (**S8700 IP**: RMC-ENV MO). If a red LED is lit on a TN736 or TN752 power unit circuit pack, replace the pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

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Table 268: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This result could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted. **NOTE:** Hyperactivity causes some special problems with the sequence suggested above.If the ports are translated after issuing the **list config** command but the `Vintage` field reports that there is no board (when there really is a board), then the **busyout board** and the **release board** commands will not work (even though the **reset board <*address*>** command will work). The software will put the hyperactive board back in service after the hyperactivity clears.

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Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack or media module to assure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of trunk.

Table 269: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Issue **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1006	ABORT	The DS1 CO trunk is out of service. **1** Use **status trunk** to verify that the trunk is out of service. **2** If the trunk is out of service, determine why. **3** If it is OK to put the trunk back in service, issue **release trunk** to put the trunk back in service, and then retry the test.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Test failed due to internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack or media module and switch software are consistent. If the trunk is busied out, the test will not run but will return PASS. To verify that the trunk is in-service: **1** Enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service. **2** Enter **release trunk** to put the trunk back into in-service. **3** Retry the test command.

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Table 269: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port. This result could be due to incorrect translations, no board inserted, an incorrect board inserted, an insane board inserted, or the board is hyperactive. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted. Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after issuing the **list config** command but the `Vintage` field reports that there is no board (when there really is a board), then the **busyout board** and the **release board** commands do not work (even though the **reset board** command does work). The software puts the hyperactive board back in service after the hyperactivity clears.

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DS1 CO Dial Tone Seizure Test (#314)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The DS1 CO Dial Tone Seizure test checks the trunk's signaling capability provided by the DS1 Interface circuit pack. The maintenance software initiates the test by sending a "seizure" message to the DS1 Interface circuit pack and expects an "active" reply from the DS1 interface circuit pack. If the "active" message is received, then the test passes. If no message is received and the timer expires, the test is aborted. If the DS1 Interface circuit pack sends a "reorder" message back to maintenance software, then the test fails.

This test cannot be run on a trunk in any of the following conditions:

- **a** The trunk direction is administered as an incoming only trunk.
- **b** The trunk has been seized by a normal trunk call.
- **c** The trunk is administered with maintenance test disabled.
- **d** **S8300** / **G700**: The trunk is on a port of an MM710 DS1 Media Module.

Table 270: Test #314 DS1 CO Dial Tone Seizure Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The test was aborted because the port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Test failed due to incompatible configuration administered in trunk group screen. **1** Look at the trunk group administration form and see whether the trunk is incoming only, port 24 on a DS1 Interface with common control channel signaling, or an automatic CO type such as FX. Under any of these conditions this is a normal abort.
1018	ABORT	Test is disabled via translation. You may want to determine why the test has been disabled before you enable it. **1** Verify that the `Maintenance Test` field on the **Trunk Group** screen is **n**. To enable the test, issue **change trunk-group <*x*>** (**<*x*>** is the number of the trunk group to be tested). Change the `Maintenance Test` field on the screen to **y**. **2** Repeat the test.
1020	ABORT	The DS1 Interface circuit pack is out-of-service. **1** Look for DS1-BD/UDS1-BD errors in the Hardware Error Log. If present, see the appropriate DS1-BD/UDS1-BD (DS1/UDS1 Trunk circuit pack). **2** Retry the command.

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Table 270: Test #314 DS1 CO Dial Tone Seizure Test

Error Code	Test Result	Description / Recommendation
1040	ABORT	The test was aborted because this port may be an access endpoint. **1** Verify that this port is an access endpoint by issuing **display port <*address*>**. **2** If the port has been administered as an access endpoint, then this is a normal abort.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
S8100: 2000	ABORT	Response to the test request was not received within the allowable time period.
2012	ABORT	The test was aborted due to an internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	FAIL	Response to the seizure message was not received within the allowable time period. **1** Enter **list configuration board <*address*>**. If the circuit pack is a TN767B vintage 8 or 9, a failure of test 314 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports will be taken out of service and extraneous on-board alarms will be generated. Replace the circuit pack with a TN767C V3 or later. **2** Verify that the `Trunk Type` field on the **Trunk Administration** form matches the trunk type administered on far-end switch. **3** Look for DS1-BD or UDS1-BD errors in the hardware error log. If present, see DS1-BD (DS1 Interface Circuit Pack) on page 760 or UDS1-BD (UDS1 Interface Circuit Pack) on page 1950. **4** Retry the command at 1-minute intervals up to 5 times.
2053	FAIL	At least one of the following errors was found on the DS1 circuit pack: Loss of signal (1281), Blue alarm (1793), Red alarm (2049), Yellow alarm (2305), or Hyperactivity (1537). **1** Look for these error types in the hardware error log, and then follow the procedures given in the maintenance documentation that is appropriate for the error type that was found.

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Table 270: Test #314 DS1 CO Dial Tone Seizure Test

Error Code	Test Result	Description / Recommendation
	FAIL	The trunk cannot be seized for an outgoing call. This could cause in-line failures to be reported against the trunk (no answer would report error type 257 with auxiliary data 57487 in the error log). **1** Verify the `Trunk Type` field on the trunk administration screen screen matches the trunk type administered on far-end switch. **2** Look for DS1-BD/UDS1-BD errors in Error Log. If present, see DS1-BD (DS1 Interface Circuit Pack) on page 760. **3** Retry the command at 1-minute intervals up to 5 times.
	PASS	The trunk can be seized for an outgoing call.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, an insane board is inserted, or the board is hyperactive. **1** Verify that the board's translations are correct. Use **list config**, and resolve any problems that are found. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the linkage between the internal ID and the port. If not, dispatch to verify that a valid board is inserted. Hyperactivity causes some special problems with the sequence suggested above. If the ports are translated after issuing **list config** but the `Vintage` field shows that there is no board (when there really is a board), **busyout board** and the **release board** do not work, even though **reset board** does work. The software puts the hyperactive board back in service after the hyperactivity clears.

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CO-TRK (Analog CO Trunk)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
CO-TRK	MAJOR[2]	**test port *location***	Analog CO Trunk
CO-TRK	MINOR	**test port *location***	Analog CO Trunk
CO-TRK	WARNING	**test port *location***	Analog CO Trunk

1 For information on specifying a location, see Command Syntax on page 179.

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75% of the trunks in this trunk group are alarmed.

S8700 / S8500 / S8100

For systems supporting circuit packs:

If ATMS testing is enabled, check the error log for ATMS errors 3840 and 3841. If the error log indicates that measurements exceeded acceptable thresholds, and no other trouble is found with **test trunk**, run the ATMS test call with **test analog-testcall port <*address*> full**.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end.

Analog CO trunks are 2-wire analog lines to the CO that support both incoming and outgoing calls. CO trunk circuit packs have eight ports, each of which provides an interface between the 2-wire CO line and the 4-wire TDM bus. The system supports the following CO trunk circuit packs:

TN438	TN2138
TN447	TN2147
TN465	TN2148
TN747	

S8300 / G700

For systems supporting Media Modules:

Analog CO trunks are 2-wire analog lines to the CO which support both incoming and outgoing calls. CO trunk MM711 Analog Media Modules have eight ports.

NOTE:
Although the CO-TRK MO is provided for G700 and G350 media gateways, this MO only partially supports the MM711 Analog Media Module.

The following sequences show the interactions between the switch and the CO during call setup for both loop-start and ground-start trunks.

Loop Start Operation

Idle State: Tip = ground, Ring = CO Battery

Outgoing Call:

1. PBX Off-Hook (Seize message): Closes the Tip-Ring Loop

   CO response: DC loop current + Dial tone
2. PBX On-Hook (Drop message): Open Tip-Ring loop, no loop current

   CO response: CO goes to idle state (see Note)

Incoming Call:

1. CO Applies Ringing Voltage

   PBX response: Detect ringing current
2. PBX Off-Hook (Answer message): Close loop

   CO response: Trip ringing, provide loop current
3. PBX On-Hook (Drop message): Open Tip-Ring loop, no loop current

   CO response: CO goes to idle state

NOTE:
CO does not normally provide an On-Hook (Disconnect) signal. Exceptions to this rule include Netherlands loop start and UK loop-calling guarded-clearing.

Ground Start Operation

Idle state: Tip = open, Ring = CO Battery

Outgoing Call:

1. PBX Off-Hook (Seize message): Places ground on Ring

   CO response: Places ground on Tip

   PBX response: Close the loop

   CO response: Provide loop current

   PBX response: Dial out digits
2. PBX On-Hook first (Drop message): Open the Tip-Ring Loop, no loop current

   CO response: Open circuit on Tip
3. CO On-Hook first (Disconnect): Open circuit on Tip, no loop current

   PBX response: Open Tip-Ring loop

Incoming Call:

1. CO Off-Hook (Seizure): CO applies ground on Tip and applies ringing voltage

   PBX response: Make trunk busy for outgoing calls
2. CO Ringing: CO applies ringing voltage

   PBX response: Detect ringing, ring destination
3. PBX Off-Hook (Answer message): Close loop

   CO response: Trip ringing, provide loop current
4. PBX On-Hook first (Drop message): Open the Tip-Ring Loop, no loop current

   CO response: Open circuit on Tip
5. CO On-Hook first (Disconnect): Open circuit on Tip, no loop current

Error Log Entries and Test to Clear Values

Table 271: CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** <*address*> **sh r 1**
1 (a)	57347	None			
15 (b)	any	Port Audit Update Test (#36)			
18	0	**busyout trunk**	WARNING	OFF	**release trunk** ***grp#/mbr#***
130(c)		None	WARNING	ON	**test port** <*address*> **sh r 2**
257 (a)	50176	None			

Table 271: CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
513 (a)	57364	None	MAJOR MINOR WARNING 2	ON	
769 (a)	57392	None	MAJOR MINOR WARNING 2	OFF	
1025 (e)	Any	Demand Diagnostic Test (#3)	MAJOR MINOR WARNING 2	OFF	**test port** <*address*> **sh r 2**
1281 (e)	Any	Demand Diagnostic Test (#3)	MAJOR MINOR WARNING 2	ON	**test port** <*address*> **sh r 3**
1537		Dial Tone Test (#0)	MAJOR MINOR WARNING 2	OFF	**test port** <*address*> **l r 2**
The next two tests abort on the G700/G350 with Error Code 1412.					
1793		Looparound and Conference Test (#33)	MAJOR MINOR WARNING 2	ON	**test port** <*address*> **l r 3**
2049		NPE Cross Talk Test (#6)	MAJOR MINOR WARNING 2	ON	**test port** <*address*> **l r 3**
2561 (d)	57345	None			
2817 (a)	57360	None			
2817 (a)	57393	None			
2817 (d)	57484	Dial Tone Test(#0)	MAJOR MINOR WARNING	OFF	**test port** <*address*> **l r 1**
3073 (d)	57376	None			
3329 (d)	57408	None			
3329 (d)	57484	Dial Tone Test (#0)	MAJOR MINOR WARNING	OFF	**test port** <*address*> **l r 1**
3585 (d)	57424	None			

Table 271: CO Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
The ATMS Transmission Tests are not supported on the G700/G350, and abort with Error Code 1412.					
3840 (f)	8000	Transmission Tests (ATMS)(#844-848)		OFF	**test analog-testcall**
3841 (f)		Transmission Tests (ATMS)(#844-848)	MINOR	OFF	**test analog-testcall**

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major alarms may be downgraded to Warning alarms based on the value used in the set options command.

Additional Information:

a These are in-line errors that have no specific test associated with them. Numerous Error Types in the table above have these errors. Refer to Table 272, CO Trunk Errors with No Tests, on page 644 for an explanation and appropriate action.

b **Error Type 15:** this is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors.

c **Error Type 130:** this error type indicates that the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

d Numerous Error Types in the table above have these errors.

- Aux data 57345 — Single polarity ringing current
- Aux data 57376 — No loop current on incoming call
- Aux data 57408 — No tip ground detected on outgoing call
- Aux data 57424 — No loop current on outgoing call
- Aux data 57484 — No dial tone on outgoing call

These errors will cause Dial Tone Test #0 to run and are only considered a problem if the Dial Tone test fails (in which case Error Type 1537 will also show up). In this case, the trunk may be put in "Ready-for-Service" state (shown as "disconnected" by status command), that allows only incoming calls. Run Dial Tone Test #0, and follow its outlined procedures.

If error count associated with this error type is very high (i.e., 255) and if Alarm Status on the Hardware Error Report is "n" (not alarmed), then the existence of this error type indicates that, despite the fact that many in-line error messages have been received, every Call Seizure test has passed. Problems at the CO may cause this condition rather than problems with the PBX.

e **Error Types 1025/1281:** these errors will be logged for every version of the CO-TRK/CO-BD. However, no MINOR alarms will be generated for Central Office Trunks [TN747B] with vintages V8 or greater. Any failures received by this test will still be logged as Error type 1025/1281.

Check for the use of MFT/Range extenders. If there are extenders present, and there are no other complaints or maintenance errors against this trunk, then there is a good chance that Test #3 failed due to excessive loop current and may be ignored.

f **Error Types 3840/3841:** Error Type 3840 indicates that test calls made by the Automatic Transmission Measurement System (ATMS) returned measurements in the unacceptable range. Error Type 3841 indicates measurements were in the marginal range. Use **list testcall detail** to examine the specific transmission parameters that are out of spec, and investigate the trunk for that kind of noise. If the noise is acceptable, then the AMTS thresholds administered on the trunk group screen should be changed.

S8300 / **G700**: The associated tests for these error types do not run on a G700 Media Gateway, and abort with Error Code 1412.

Table 272: CO Trunk Errors with No Tests

Error Type	Aux Data	Error Description and Repair Action
1	57347	Port error. Ringing without ground. This error is detected on an incoming call on a ground-start CO trunk. The CO trunk circuit pack has not detected a Tip ground before ringing current is detected. This may indicate that the ground detector is not working. However, the call will be accepted. Busyout the affected port, and run a long test. Observe the test results. If any tests fail, refer to the description of the tests and the associated error codes. Release the port. If users continue to report troubles, check for other errors and make test calls to determine whether the problem should be referred to the CO.
257	50176	Battery reversal detected. This is usually caused by the CO (often seen with step-by-step and cross-bar offices in connection with outgoing calls). This is detected if the direction of the loop current changes from normal to reverse for at least 40 msec. Could occur if the trunk was just installed and for some reason the Tip and Ring wires were reversed at the PBX. If battery reversals occur during dialing, wrong numbers may result. Refer problem to CO. Ask them to remove the battery reversal option.
513	57364	Ground detector stuck active. After several occurrences, an on-board minor alarm is generated. Run the short test sequence. If test aborts with Error Code 1000, disconnect Tip and Ring and repeat short test. If test still aborts, replace circuit pack. If test passes, refer problem to CO. If any other error code is received, pursue that problem.
769	57392	CO not releasing after call is dropped from PBX end, or the loop is not open after a disconnect. After several occurrences, an off-board or on-board warning alarm is generated. Refer problem to CO.

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Table 272: CO Trunk Errors with No Tests

Error Type	Aux Data	Error Description and Repair Action
2561	57345	Single polarity ringing current. This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. One cause could be that the reverse current detector associated with the port is failing. (Will not be detected by any tests.) Another cause could be that normal current is not detected. In this case, neither incoming nor outgoing calls can be completed, and the dial tone test will also fail. The last cause could be that certain types of noise are present on the CO line during the silent period of ringing. First check for other errors. If the count for this error is very high (255), and every test passes, then either the reverse current detector is defective or the CO line is noisy. If the CO line is suspect, make Tip and Ring observations. If the line is determined to be noisy, refer the problem to the CO. If the reverse current detector is defective, ignore this error.
2817	57360	Ground but no ringing. This error occurs on an incoming call on a ground-start trunk. If ringing is not detected within 5 seconds of the Tip being grounded, the call is still accepted. If the CO is of the No. 5ESS. switch type, ringing delays of more than 5 seconds during heavy traffic are fairly common. Check for other errors.
2817	57393	The loop is opening too slowly after a disconnect. This error indicates an on-board problem, although the trunk may be functional. Check for other errors.
3073	57376	No loop current on incoming call. The incoming destination has already answered and no loop current has been detected. If this is a hard fault, the dial tone test and every outgoing call should also fail. Check for other errors.
3329	57408	Trunk error. No Tip ground detected on outgoing call. This error occurs when an attempt is made to seize a ground-start CO trunk for an outgoing call and Tip ground is not detected or the caller hangs up before Tip ground is detected. **1** Busyout the affected port, and run a long test. Observe the test results. If any tests fail, refer to the description of the tests and the associated error codes. Release the port. **2** If users continue to report troubles, check for other errors and make test calls to determine whether the problem should be referred to the CO. Busyout the affected port, and run a long test. If Dial Tone Test #0 passes, ignore this error. Release the port.
3585	57424	No loop current on outgoing call. This error occurs on attempt to seize a loop or ground-start trunk for an outgoing call. An error occurs if loop current is not detected or the caller hangs up before it is detected. Busyout the affected port, and run a long test. If CO Demand Diagnostic Test #3 passes and this error keeps occurring, refer problems to CO. Release the port.

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System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *NPE Crosstalk* test (#6), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Dial Tone test (#0)		X	ND
CO Demand Diagnostic test (#3)	X	X	ND
Looparound and Conference test (#33) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Audit Update test (#36)	X	X	ND
Transmission test - ATMS (#844-848) **S8300** / **G700**: This test aborts with Error Code 1412.			ND

1 D = Destructive; ND = Nondestructive

NOTE:
A Demand Diagnostic test (#3) will always return a PASS indication for CO-TRK/CO-BD [TN747B] version 8 or greater. However, any errors produced as a result of this test will be logged and produce no alarms.

If errors logged by Test #3 are the only complaints against this trunk, then the system technician should check if MFT/Range Extenders are being used. If extenders are present, then there is a good chance that there is excessive loop current, which will cause Test #3 to log errors.

However, all else being normal, these errors should not affect the customer.

NOTE:
The ATMS tests are not part of either test sequence. They are run either on demand with **test analog-testcall** or by the ATMS schedule.

Dial Tone Test (#0)

This test attempts to seize a port and checks for the return of a dial tone.

Table 273: Test #0 Dial Tone Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is active, then it is unavailable for certain tests. Wait until the port is idle before retesting. **1** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test were not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is active, then it is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Trunk has been administered as incoming-only; dial tone can only be obtained on outgoing trunks. This is a normal condition.
1018	ABORT	Test has been disabled by administration. **1** Verify that the `Maintenance Tests` field on the **Trunk Group** form is set to **n**. To enable the test, use **change trunk-group <*x*>** where **<*x*>** equals the number of the trunk group to be tested. Change the entry in the `Maintenance Tests` field on the screen to **y**
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 273: Test #0 Dial Tone Test

Error Code	Test Result	Description / Recommendation
	FAIL	Trunk was seized, but dial tone could not be detected. **1** Test every administered outgoing port on the board. Failure of 1 port indicates a problem toward the CO. **2** If every port fails, see note below. **3** Check for errors on the TONE-BD or TONE-PT. Clear any errors found, and repeat the test. **4** If the error has still not cleared, refer the problem to the CO. **5** If no service problems exist on the port, continue to use the port until the circuit pack or media module can be replaced (as a last resort). Perform a trunk test call to see if the trunk is operable. **NOTE:** If the dial tone test fails for every port on a circuit pack or media module, a -5 Volt power problem is indicated. To investigate problems with a power unit, seeCARR-POW (Carrier Power Supply) on page 578 (**S8700 IP**: RMC-ENV (Power/Fan Sensors) on page 1593).
2002	FAIL	Seizure portion of test failed due to hardware problem. Fault is usually caused by a disconnected trunk. **1** If the CO Demand Diagnostic test (#3) also failed, display the Hardware Error Log. If the CO Demand Diagnostic test failed because it could not detect ground (indicated by Error Type 1281 in the Hardware Error Log) AND Error Type 3329 or 3585 appears in the Hardware Error Log (with the same last occurred time as Error Type 1281 and 1537), replace the circuit pack or media module. **2** Check trunk wiring to ensure good connection; repeat test if wiring correction made. **3** Locate another identical CO trunk and swap its wiring with the one under test. Repeat test on both trunks, and determine whether problem follows trunk or remains at original port. If problem follows trunk, refer problem to CO. If problem remains at the port, replace the circuit pack or media module and repeat the test.
1009	PASS	Detected tone was not pure dial tone. No action required.

Table 273: Test #0 Dial Tone Test

Error Code	Test Result	Description / Recommendation
	PASS	Trunk was seized, and dial tone was detected. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port. **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*>** command. This should re-establish the linkage between the internal ID and the port.

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CO Demand Diagnostic Test (#3)

For ground start trunks, circuit pack or media module port relays are operated and checks are made to see if the port can detect and apply ground on the Tip lead. This test also verifies that there is no external ground on the Ring lead. In the absence of other failures, the circuit pack or media module should be replaced only if this test fails with the CO line disconnected.

This test also checks the on-board programmable transmission circuits that allow the circuit pack or media module to support transmission characteristics of several different countries.

Table 274: Test #3 CO Demand Diagnostic Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is active, then it is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.

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Table 274: Test #3 CO Demand Diagnostic Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is active, then it is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Test inapplicable to present configuration. This is a normal condition.
1018	ABORT	Test has been disabled by administration. **1** For this test to run, the `Maintenance Tests` field on the **Trunk Group** form must be **n**. Use **change trunk-group <*grp*>#** to check the field.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 274: Test #3 CO Demand Diagnostic Test

Error Code	Test Result	Description / Recommendation
	FAIL	Failure to detect ground or faulty ground detected on Ring lead. Display the hardware errors for this trunk, to determine whether the fault was on- or off-board. Look for Error Type 1025 or 1281 (if both appear in the Hardware Error Log, pick the most recent error). Error Type 1025 indicates a faulty ground detected on Ring lead (an off-board fault) and Error Type 1281 indicates failure to detect (internally generated) ground (an on-board fault). Faulty ground detected on Ring lead (Error Type 1025): **NOTE:** On TN747B vintage 8 and greater circuit packs, an incoming seizure during this test may cause it to fail with an off-board fault. **1** Repeat test. If test passes, ignore the original failure. If test aborts, follow the recommended procedures. **2** Repeat test with CO line removed. **3** If test fails, replace the circuit pack or media module. **4** If test passes, refer problem to CO. Failure to detect ground (Error Type 1281): **1** Run the long test sequence. If the CO Demand Diagnostic test fails, the Dial Tone test (#0) fails with Error Code 2002, AND Error Type 3329 or 3585 appears in the Hardware Error Log (with the same last occurred time as Error Type 1281 and 1537), replace the circuit pack or media module. **2** Repeat test with CO line removed. **3** If test fails, replace the circuit pack or media module. **4** If test passes, the CO may be drawing too much current. Refer problem to CO.
S8100: 57481	FAIL	On-board test of programmable transmission circuitry failed. **1** Replace the circuit pack.
	PASS	This test verifies that the port is able to apply ground for outgoing calls and detect ground for incoming calls; however, it does not provide information about whether a CO line is actually connected. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

Table 274: Test #3 CO Demand Diagnostic Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*>** command. This should re-establish the linkage between the internal ID and the port.

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NPE Crosstalk Test (#6)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in approximately 20 to 30 seconds.

Table 275: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. Check the CO wiring, check for excessive loop current, and check the trunk translations. (If the trunk is translated incorrectly, this test will abort.) **3** If the port status is idle, busyout and release the trunk, and retry the command at 1-minute intervals up to 5 times. **4** If the test still aborts, replace the circuit pack.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 275: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*>** command. This should re-establish the linkage between the internal ID and the port.

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Looparound and Conference Circuit Test (#33)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

This test checks the reflective loop-around and conference capabilities of a CO port circuit. The test uses 404-Hz, 1004-Hz, and 2804-Hz tones. Each tone is transmitted separately through the loop and checked.

Table 276: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test.
7	ABORT	Conference Circuit test aborted.
129	ABORT	The 404-Hz reflective loop-around test aborted. Response to the test request was not received within the allowable time period.
131		The 1004-Hz reflective loop-around test aborted. Response to the test request was not received within the allowable time period.
133		The 2804-Hz reflective loop-around test aborted. Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for error type 769 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.

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Table 276: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1018	ABORT	The test was disabled by administration. Verify that the `Maintenance Test` field on the Trunk Group screen is set to **n**. To enable the test, use **change trunk-group <x>**, where **<x>** equals the number of the trunk group to be tested. Change the `Maintenance Test` field on the screen to **y**. **1** Retry the command at 1-minute intervals up to 5 times.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
7	FAIL	The conference capabilities of the port failed (Error Code 7).
129		The reflective 404-Hz Tone test failed. No transmission was detected to or from the port (Error Code 129).
131		The reflective 1004-Hz Tone test failed. No transmission was detected to or from the port (Error Code 131).
133		The reflective 2804-Hz Tone test failed. No transmission was detected to or from the port (Error Code 133). FAULT ISOLATION: Proceed as follows unless power or tone problems are suspected (see notes on the next page). **1** To make sure the problem is on-board, disconnect the port from the CO and retry the test. Coordinate this with the CO, or do it after busy hours; otherwise, the CO may put the connection out of service. **2** If the retry fails, replace the circuit pack. **3** If the retry passes and no troubles have been reported, disable the test. If the retry passes and troubles have been reported, refer the problem to the CO.

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Table 276: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
7, 129, 131, or 133	FAIL	If the Looparound and Conference Circuit test (#33) fails for every port on a circuit pack, a -5 Volt power problem is indicated. To investigate problems with a power unit, see CARR-POW (Carrier Power Supply) on page 578 (**S8700 IP**: RMC-ENV (Power/Fan Sensors) on page 1593). If a red LED is lit on the power unit circuit pack, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test. **S8700 MC**: if the test fails again, see Fault Isolation Using Duplicated PNC on page 1487.
	PASS	CO Trunk Looparound and Conference test is successful. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board<*address*>** command. **5** Issue the **test board <*address*>** command. This should re-establish the linkage between the internal ID and the port.

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Port Audit Update Test (#36)

This test will send updates of the CO port translation for every port on the circuit pack or media module that has been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack or media module. No response message is expected from the circuit pack or media module once it receives translation updates. The port translation data includes: ground or loop start trunk, tone or rotary dialing trunk, rotary dialing inter-digit timing, network balance R/RC, and disconnect timing.

Table 277: Test #36 Port Audit Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1006	ABORT	The port has been placed out of service, perhaps by craft busyout. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is active, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test were not available. **1** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	This test passed. Translation information was successfully updated on the circuit pack or media module. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring. If the trunk is busied out, the test will not run, but will return PASS. To verify that the trunk is in-service: **1** Enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to step 2. **2** Enter **release trunk** to put trunk back into in-service. **3** Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue **test board <*address*>**. This should re-establish the linkage between the internal ID and the port.

Transmission Test (#844-848)

This test is nondestructive.

NOTE:
S8300 / **G700**: The G700 Media Gateway does not support the Automatic Transmission Measurement System. These tests abort with Error Code 1412.

NOTE:
Tests #844 – 848 are not supported on an International switch.

These tests are run by the ATMS (Automatic Transmission Measurement System). They are not part of the long or short trunk test sequences. Instead, they are run on demand with the **test analog-testcall** command or as part of ATMS scheduled testing. For more information, see 'Automatic Transmission Measurement System in Maintenance Procedures (555-245-103).

The test call is run from an analog port on a TN771 Maintenance/Test circuit pack. It attempts to seize a port and make a call to a TTL (terminating test line) on the trunk's far end. Transmission performance measurements are made and compared to administered thresholds. Errors are generated when results fall outside of "marginal" or "unacceptable" thresholds. Detail and summary measurement reports are obtainable via the **list testcalls** command.

Table 278: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is active, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions or it may have timeslots out of service due to TDM bus errors. **1** If the system has no TDM bus errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use status trunk to determine when the port is available for testing. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Trunk has been administered as incoming-only; transmission tests can only be run on outgoing trunks.

Table 278: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1115	ABORT	The near-end test line on the TN771 circuit pack (**S8100**: TN2314 circuit pack) could not be allocated. **1** Verify that the TN771 circuit pack (**S8100**: TN2314 circuit pack) is in service and that port 1 is administered and in service with **status port**. **2** Retry the command at 1-minute intervals up to 5 times.
1900	ABORT	The test completion message was not received from the TN771 circuit pack (**S8100**: TN2314 circuit pack). **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1901	ABORT	This error occurs when the TN771 circuit pack (**S8100**: TN2314 circuit pack) uplinks a message that is not the proper response for this test. The anticipated uplink messages are seize, ring or answer. **1** Verify that the trunk is administered properly.
1905	ABORT	Intercept tone detected from far end. **1** Get the test line data from and verify it with the far end. **2** Dial the test number manually to see if the TTL is reached. If not, then either the number is wrong or the far end is administered incorrectly.
1906	ABORT	Reorder tone detected from far end. **1** See actions for error code 1905.
1907	ABORT	Other unexpected tone detected from far end. **1** See actions for error code 1905.
1913	ABORT	Audible Ring detected from far end. **1** See actions for error code 1905.
1914	ABORT	Unidentified interrupted tone detected from far end. **1** See actions for error code 1905
1915	ABORT	Busy tone detected from far end. **1** Since the test line at the far end was busy, try the test again. **2** If the test continues to abort, the problem is with the far-end system.
1918	ABORT	Test progress tone not removed from far end (type 105 test line only). **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 (**S8100**: TN2314 circuit pack) or ADFTC).
1919	ABORT	Unexpected far-end release **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 (**S8100**: TN2314 circuit pack) or ADFTC).

Table 278: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1920	ABORT	No response from far end. **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 (**S8100**: TN2314 circuit pack) or ADFTC).
1921	ABORT	No data returned from far end. **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 (**S8100**: TN2314 circuit pack) or ADFTC).
1922	ABORT	Steady, unidentifiable tone from far end **1** See actions for error code 1905.
1923	ABORT	Broadband energy detected from far end (such as voice or announcement). **1** See actions for error code 1905.
1924	ABORT	No test tone from far end **1** See actions for error code 1905.
1938	ABORT	Near-end self test failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1939	ABORT	Loss self check at 0dBm at 1004 Hz failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1940	ABORT	Far-end noise self check failed. **1** The problem is with the far end system; a technician at the far end should test the test line (TN771 (**S8100**: TN2314 circuit pack) or ADFTC).
1941	ABORT	High-frequency singing return loss self check failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1942	ABORT	Echo return loss self check failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1943	ABORT	Singing return loss self check failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1944	ABORT	Loss self check at -16 dBm at 1004 Hz failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1945	ABORT	Loss self check at -16 dBm at 404 Hz failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
1946	ABORT	Loss self check at -16 dBm at 2804 Hz failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).

Table 278: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1947	ABORT	Noise with tone self check failed. **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
2000	ABORT	The test timed out while waiting for a response from the TN771 circuit pack (**S8100**: TN2314 circuit pack). **1** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	An internal software error occurred. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	The test call could not be established, but an explanation is unavailable. **1** Retry the command at 1-minute intervals up to 5 times.
2056	ABORT	An error occurred while trying to obtain results from the TN771 circuit pack (**S8100**: TN2314 circuit pack). **1** Test the TN771 circuit packs (**S8100**: TN2314 circuit packs).
	FAIL	Measured transmission performance was in the unacceptable range as administered on the trunk group screen. Retrieve a measurement report via the **list testcalls** command. Make sure that ATMS thresholds are set properly on page 4 of the trunk group screen. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.
8000	FAIL	Measured transmission performance was in the marginal range as administered on the trunk group screen. This generally means that the trunk is usable but has an undesirable amount of noise or loss. If the user does not report unacceptable effects, it may not be necessary to take any action. Retrieve a measurement report via **list testcalls**. Make sure that ATMS thresholds are set properly on page 4 of the trunk group screen.

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CONFIG (System Configuration)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
CONFIG	none	none	System Configuration

The System Configuration MO oversees logical insertion and removal of circuit packs in the system. When Switch Control detects that a circuit pack is present in a port slot, it informs System Configuration and System Configuration queries the circuit pack to determine the type and vintage of the circuit pack. Similarly, when Switch Control detects that a circuit pack has been removed from a port slot, it informs System Configuration.

There are no alarms or tests for System Configuration, but three types of errors are logged to the Hardware Error Log.

Error Log Entries and Test to Clear Values

Table 279: System Configuration Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	none	none	N/A	none
1–119 (a) **S8100**: 2-117	0–21	none			
257 (b)		none	MAJOR		
1001–1119 (c) **S8100**: 1002-1117	0–21	none			

1 This error should not occur. It indicates that an attempt was made by software to raise an alarm against CONFIG without first logging a CONFIG error.

Notes:

a This error indicates that a port circuit pack in the system did not respond to a circuit pack type inquiry. Follow the procedures outlined in (c) to determine whether there is an error.

b This error indicates that less than 25% of trunk group is available.

c This error indicates that a port circuit pack in the system did not respond to a vintage inquiry.

As a result of either of these errors, a port circuit pack may be physically inserted in a port slot, but the system may not recognize its existence. The `Aux Data` field specifies the circuit pack's port-network number as indicated in the following table.

Converting Aux Data to Port-Network Number

Aux Data	Port-Network Number
0	1
1	2
2	3
3	4
4	5
5	6
6	7
7	8
8	9
9	10
10	11
11	12
12	13
13	14
14	15
15	16
16	17
17	18
18	19
19	20
20	21
21	22

The `Error Type` field specifies the carrier and slot location of the circuit pack that caused the error as indicated in Table 280, Converting Error Types To Carrier Locations, on page 664. If the `Error Type` is greater than 1000, subtract 1000 from the `Error Type` field before consulting the table.

S8700 MC:Before proceeding, if multiple CONFIG errors are simultaneously logged with an Aux Data of 1, investigate any EXP-INTF (Expansion Interface) errors.

Once the port's circuit-pack location has been determined from Table 280, Converting Error Types To Carrier Locations, on page 664, use the **list configuration all** command to determine whether the circuit pack is inserted. If the circuit pack has already been inserted but the error persists, replace the circuit pack. If not, insert the pack.

Table 280: Converting Error Types To Carrier Locations

Error Type	Carrier Location
1	(a)
2	E01
3	E02
4	E03
5	E04
6	E05
7	E06
8	E07
9	E08
10	E09
11	E10
12	E11
13	E12
14	E13
15	E14
16	E15
17	E16
18	E17
19	E18
20	E19
21	E20
22	E00 (d)
23	(a)
24	(a)
25	(a)
26	(a)
27	A00 (e)
28	A01 (b)
29	A02
30	A03
31	A04
32	(a)
33	(a)

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Table 280: Converting Error Types To Carrier Locations

Error Type	Carrier Location
34	D01
35	D02
36	D03
37	D04
38	D05
39	D06
40	D07
41	D08
42	D09
43	D10
44	D11
45	D12
46	D13
47	D14
48	D15
49	D16
50	D17
51	D18
52	D19
53	D20
54	D00 (d)
55	(a)
56	A05
57	A06
58	A07
59	A08
60	A09
61	A10 (c)
62	A11
63	A12
64	(a)
65	(a)
66	B01

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Table 280: Converting Error Types To Carrier Locations

Error Type	Carrier Location
67	B02
68	B03
69	B04
70	B05
71	B06
72	B07
73	B08
74	B09
75	B10
76	B11
77	B12
78	B13
79	B14
80	B15
81	B16
82	B17
83	B18
84	B19
85	B20
86	B00 (d)
87	(a)
88	A13
89	A14
90	A15
91	A16
92	A17
93	A18
94	A19
95	A20
96	(a)
97	(a)
98	C01
99	C02

Table 280: Converting Error Types To Carrier Locations

Error Type	Carrier Location
100	C03
101	C04
102	C05
103	C06
104	C07
105	C08
106	C09
107	C10
108	C11
109	C12
110	C13
111	C14
112	C15
113	C16
114	C17
115	C18
116	C19
117	C20
118	C00 (d)
119	(a)

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Notes:

a These error types do not represent physical port circuit pack slots and are not logged against CONFIG..

b If this error type occurs in a PN, it refers to the circuit pack in slot A01.

c If this error type occurs in a PN, it refers to the circuit pack in slot A10.

d Slots B00, C00, D00, and E00 refer to the *Service Slots* in the B, C, D, and E carriers.

e In a PN's A carrier, slot A00 is the Tone Generator's slot.

CUST-ALM (Customer-Provided Alarming Device)

S8700 / S8500 / S8100

See MAINT (PN's Maintenance Circuit Pack) on page 1174 for information about this maintenance object.

DAT-LINE (Data Line Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DAT-LINE	MINOR	**test port *location* l**	Data Line port
DAT-LINE	WARNING	**test port *location* l**	Data Line port

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN726 Data Line circuit pack has eight ports, each of which supports an RS-232 interface to asynchronous CPE (customer-premises equipment). Each of these ports and the equipment connected to it constitute a data line. For DT-LN-BD (Data Line circuit pack) errors, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086. Check circuit pack-level errors first since the usability of the ports depend on the health of the circuit pack.

Use **add data-module** to administer data line ports at the terminal. The data module type is *data-line*. The **list data-module** command shows every administered data module in the system.

The TN750 Announcement circuit pack has one data line-type port on it. This data line port is used for saving and restoring announcements. For a description of and repair instructions for the TN750, see ANL-BD (Analog Line Circuit Pack) on page 262.

NOTE:
If the tests for the data line port in question pass, and user-reported complaints persist, there is probably an external problem. Test the ADU (asynchronous data unit), using the procedures in *User Manual Z3A Asynchronous Data Unit, 555-401-701*. If the ADU appears to be working properly, check the external wiring, and then check the customer equipment.

Error Log Entries and Test to Clear Values

Table 281: Data Line Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1		Digital Looparound test (#171)	MINOR	ON	**test port** *UUCSSpp* **s r 2**
15(a)	Any	Audit Update test (#36)			
18	0	**busyout port** *UUCSSpp*	WARNING	OFF	**rel port** *UUCSSpp*
130 (b)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257		Conference Circuit test (#7)	MINOR	ON	**test port** *UUCSSpp* **l r 2**
513		NPE Crosstalk test (#6)	MINOR	ON	**test port** *UUCSSpp* **l r 2**
769(c)	40983 **S8100**: Any	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

Notes:

a This is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate errors.

b Indicates the circuit pack has been removed or has been insane for more than 11-minutes. To clear the error, reseat or replace the circuit pack.

c Error type 769 indicates that the data line circuit pack found an error in the transmit/receive circuitry of an administered data line when the circuit pack was inserted. Perform the following:

1. Enter **busyout board UUCSS f**or the circuit pack on which the port resides.
2. Enter **reset board UUCSS**. Check the Error Log to determine whether Error Type #769 is logged again for DAT-LINE. Make sure that the `Active Alarms Only` field is set to **n**.

   If Error Type #769 reappears, replace the data line circuit pack. If not, proceed to step 3.
3. Enter **release board UUCSS**.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. For example, by clearing error codes associated with the Digital Looparound test, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Looparound test (#171)	X	X	ND
NPE Crosstalk test (#6)		X	ND
Conference Circuit test (#7)		X	ND
Audit Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 282: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** Resolve any TDM-BUS errors. **2** If the system is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.

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Table 282: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV and TONE-PT errors. **2** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was in use on a valid call. **1** Determine whether the port is available for testing (**status data-module**). **2** When available, retry the command at 1-minute intervals up to 5 times.
1020	ABORT	An existing Error Type 769 on this port prevented the test from running. **1** Follow the procedures for Error Type 769.
2000	ABORT	Response to the test command was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was transmitting in error, which can cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** Investigate user-reported troubles on this port using other port tests and examining the ADU, external wiring, and customer equipment.

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Conference Circuit Test (#7)

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

Table 283: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use **status data-module** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	An existing Error Type #769 on this port prevented the test from running. **1** Follow the procedure following the Error Log Table for Error Type #769.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The conference circuit test failed (possible off-board problem). **1** Busyout and release the port (data line), and then retest. **2** Replace the circuit pack if the test continues to fail.
	PASS	The port can correctly conference multiple connections. Investigate user-reported troubles on this port using other port tests and examining the ADU, external wiring, and customer equipment.

Audit Update Test (#36)

This audit verifies that the hardware state of the data line is consistent with the system translations. The audit queries the port for the switchhook state, the software state is updated according to the returned value. Also, the audit data line options down to the port.

Table 284: Test #36 Audit Update Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate the problem if the test continues to abort.
1006	ABORT	An existing Error Type #769 on this port prevented the test from running. **1** Follow the procedure following the Error Log Table for Error Type #769.

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Table 284: Test #36 Audit Update Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	ABORT	Internal system error **1** Try the command again at 1-minute intervals up to 5 times.
7	FAIL	Internal system error **1** Try the command again at 1-minute intervals up to 5 times.
	PASS	The hardware port state is consistent with the software state. Investigate user-reported troubles on this port using other port tests and examining the ADU, external wiring, and customer equipment.

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Digital Loop-Around Test (#171)

The Digital Looparound test checks the data line port's ability to transmit and receive data on the TDM Bus. Data is sent through an available Maintenance/Test digital port over the TDM Bus, internally looped through the data line port back onto the TDM Bus, and received again by the same Maintenance/Test digital port.

Only one of the two digital ports on a Maintenance/Test circuit pack is used for this test, and that port must be the **first** such port; such as port 02. If port 02 is in use, out-of-service, or not present, the test aborts. This test may fail if the Maintenance/Test digital port used by the test is not functioning properly. If there are any M/T-DIG errors in the Error Log, see M/T-BD (Maintenance/Test Circuit Pack) to clear them first.

S8100

If there are any DATA-CHL errors in the Error Log, see DATA-BD (Data Channel Processor circuit pack) maintenance documentation to clear them first.

This test will pass regardless of any customer equipment that may be connected to the port, as long as the equipment is not using the port.

Table 285: Test #171 Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
S8100: 1005 1007	ABORT	Data Channel 3 is not administered. This port is required to run this test. **1** Verify that data channel 3 is not administered with the **list data-module** command. Administer data channel 3 with the **add data-module** command, and run this test again.
S8100: 1016	ABORT	Data Channel 3 is busy. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1020	ABORT	An existing Error Type #769 on this port prevented the test from running. **1** Follow the procedure following the Error Log Table for Error Type #769.
1042	ABORT	Port under test is a TTI port and has only default translations with no assigned extension. The executed test requires an assigned extension associated with the port being tested. Therefore, this test cannot successfully execute. **1** If there is a need to execute the test on this particular port, then the tester must ensure that the port is fully translated such that the port has an assigned extension.

Table 285: Test #171 Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
1180	ABORT	There is no Maintenance/Test circuit pack digital port available to carry out the test. **1** Check to see if the Maintenance/Test digital ports are present. (Enter **list config**; ports 02 and 03 should show). **2** If the digital ports (02 and 03) on the Maintenance/ Test circuit pack are not present, see M/T-BD (Maintenance/Test Circuit Pack) on page 1338. **3** If the digital ports are present, retry the command at 1-minute intervals up to 5 times.
1181	ABORT	No time-slots available to connect digital ports for the test.
1182	ABORT	Internal system error. Failed to connect the digital ports with time-slots. **1** Retry the command at 1-minute intervals up to 5 times.
1340	ABORT	No Maintenance/Test digital port is currently available to perform this test. **1** Use **list config** to determine whether any Maintenance/Test digital ports (ports 02 and 03 on the Maintenance/Test circuit pack) are present in the system. At least one Maintenance/Test circuit pack must be present in PN 1 of the system. There should be at least two such ports present. If the ports are present, proceed to step 2. Otherwise, determine why no ports appear in the **list config** display. Refer to "M/T-DIG" and "M/T-BD". **2** Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port). **3** If the ports are present and no errors are logged against them, retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, replace the Maintenance/Test circuit pack.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a "t" for the port). **2** If either **list config** or **display port** indicates that the port is **not** a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate the problem if the test continues to abort.
S8100: 2003	ABORT	Failed to receive an off-hook from the Data Line. **1** Retry the command at 1-minute intervals a maximum of 5 times.

Table 285: Test #171 Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
S8100: 2004	ABORT	Failed to receive an off-hook from the Data Channel.
2004	ABORT	Off hook was not received from the data line device. **1** Busyout the digital port being tested on the data line circuit pack. Retry the command at 1-minute intervals up to 5 times. **2** If the test still aborts, replace the circuit pack.
2005	ABORT	The handshake between the Maintenance/Test circuit pack digital port and the data line port failed. **1** Resolve any M/T-DIG errors. S8100: Look for DATA-CHL errors in the Error Log. If present, refer to DATA-BD (Data Channel Processor circuit pack) Maintenance documentation. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test still aborts, replace the data line circuit pack.
S8100: 2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2312	ABORT	Test did not finish, did not receive loop back data. **1** Resolve any M/T-DIG errors. **2** Retry the test, if still aborts, replace the Data Line circuit pack.
2313	ABORT	Failed to receive a response from the Maintenance/Test digital port. **1** Resolve any M/T-DIG errors. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, replace the Maintenance/Test circuit pack.
2314	ABORT	Data line port did not respond to downlinked message. **1** Busyout the digital port being tested on the data line circuit pack. Retry the command at 1-minute intervals up to 5 times. **2** If the test still aborts, replace the circuit pack.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

Table 285: Test #171 Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
S8100: 2000	FAIL	The test failed waiting for the transmitted data to be looped back. **1** Look for DATA-CHL errors in the Error Log. If present, refer to DATA-BD (Data Channel Processor circuit pack) Maintenance documentation. **2** Repeat this test. **3** If the test fails again, replace the Data Line circuit pack.
	FAIL	The test failed because the data received did not match the data sent. This would indicate that there is a fault somewhere in the transmit/receive path to the TDM Bus, which will probably result in data corruption over this port. This test may fail if the Maintenance/Test digital port (S8100: Data Channel 3) used by the test is not functioning properly. **1** Resolve any M/T-DIG errors. S8100: Look for DATA-CHL errors in the Error Log. If present, refer to DATA-BD (Data Channel Processor circuit pack) Maintenance documentation. **2** Repeat Test #171. **3** If the test fails again, replace the data line circuit pack.
	PASS	The port can correctly transmit/receive data. Investigate user-reported troubles on this port using other port tests and examining the ADU, external wiring, and customer equipment.

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DC-POWER (Single-Carrier Cabinet Environment)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DC-POWER	MAJOR	**test environment *UU***	Single-Carrier Cabinet Environment

1 ***UU*** is the universal cabinet number indicated in the PORT field of the alarm log.

The S8700 Sever in a Multi-Connect configuration supports two different cabinet types: multicarrier and single-carrier. Single-carrier cabinets are used only for PNs. Both cabinet types may be powered by either AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply. Refer to the following table to determine which MO documentation to use for environmental maintenance.

Cabinet Type	Power Source	Environmental Maintenance Objects
Single-carrier (PN)	AC or DC	DC-POWER (all environmental maintenance)
Multicarrier	AC	AC-POWER for AC-powered systems (external power source) POWER for AC-powered systems (battery backup) CARR-POW (carrier port power supply) CABINET (temperature and fan sensors)
Multicarrier	DC	CARR-POW (carrier port power supply) CABINET (temperature and fan sensors)

The DC-POWER MO represents all environmental maintenance for single-carrier cabinets, whether the external power supply is AC or DC. This includes the external power supply and every Carrier Port Power Supply in an PN composed of a single-carrier cabinet stack. A Carrier Port Power Supply provides +5, -5, and/or -48 Volts DC to the circuit packs on the carrier. The following power supplies are used:

WP-91153	Accepts AC power input
676B	Accepts DC power input

Each power unit has one amber LED. A lit LED signifies normal operation. An unlit LED signifies a loss of external power to the cabinet, or a fault in the power unit. When hardware detects a problem with any of these components, it reports the information to the system software through a single lead. System software does not differentiate between different environmental failures. Since several environmental elements of single-carrier cabinets are logged against the DC-POWER MO, it is possible to have a DC-POWER alarm while there is still power to the system.

If a Carrier Port Power Supply is physically removed from a carrier in a single-carrier cabinet, there will not be a DC-POWER alarm. DC-POWER maintenance cannot distinguish between removal of the power supply and the physical absence of the cabinet.

There is a nominal power holdover of .25 second in an PN single-carrier cabinet.

Hardware Error Log Entries and Test to Clear Values

Table 286: Single-Carrier Cabinet Power Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value[1]
0[2]	0	Any	Any	Any	**test environment *UU***
513	0 or 1	Single-Carrier Cabinet Power Query Test (#79) on page 681	MAJOR	ON	**test environment *UU* r 2**

1 UU is the universal cabinet number indicated in the PORT field of the Alarm Log.

2 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the Single-Carrier Cabinet Power Query test, for example, you may also clear errors generated from other tests in the testing sequence. Test description(s) and recommended maintenance procedures follow for every error that can occur during technician-demanded testing.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Single-Carrier Cabinet Power Query test (#79)	X	X	ND
Emergency Transfer Query test (#124) (a)	X	X	ND
External Alarm Lead Query test (#120) (b)	X	X	ND
Analog Ring Generator Initialization test (#117) (c)	X	X	ND
Analog Ring Generator Query test (#118) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a See EMG-XFER (Emergency Transfer) on page 885 for a description of this test.

b See EXT-DEV ADMIN? Y (External Device Alarm) on page 972 for a description of this test.

c See RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

Single-Carrier Cabinet Power Query Test (#79)

This test queries an PN's Maintenance circuit pack about the power's status in a single-carrier cabinet PN. This test can only detect power problems in the carriers of the PN where the Carrier Port Power Supply physically resides.

Table 287: Test #79 Single-Carrier Cabinet Power Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to ABORT with a 2000 error code, check for and resolve every MAINT (Maintenance circuit pack) error. Then, repeat the test. **3** If the test still aborts with this error code, escalate the problem.
2029, 2319, 2320, 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	There is currently a problem with the environment of the power system. **1** The power supply to any one of the carriers may have been lost. **a** Verify, and if necessary restore, AC power at the wall outlet for each carrier. **b** Rerun the test. If the test still fails, proceed to step 2. **2** One of the WP-91153 or 676-B power units for one of the carriers could be defective. **a** If a WP-91153 or 676-B power unit does not have its yellow status LED on, then replace the power unit (procedure in Chapter 8, "Component replacement" in *Maintenance Procedures (555-245-103)*). **b** Rerun the test. If the test still fails, proceed with step 3. **3** The PN's MAINT (Maintenance circuit pack) could be incorrectly reporting this error. Resolve every alarm on these MOs, and rerun the test. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but that will cause many, if not all, environment tests to fail. If more than two environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. If the test still fails, follow normal escalation procedures.
	PASS	The PN's MAINT (Maintenance circuit pack) has reported no problem with the power.

DETR-BD (Tone Detector Circuit)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DETR-BD	MINOR	**test board *location***	Tone Detector circuit
DETR-BD	WARNING	**test board *location***	Tone Detector circuit

1 For information on specifying a ***location***, see Command Syntax on page 179.

For proper tone detection, the companding mode administered for the system must match that of the DETR-BD circuit. The companding mode is administered on the ***location-parameters*** screen.

For any DETR-BD (Tone Detector circuit) errors, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

DID-BD (Direct Inward Dial Trunk Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DID-BD	MINOR	**test board *location* sh**	Direct Inward Dial Trunk circuit pack
DID-BD	WARNING	**test board *location* sh**	Direct Inward Dial Trunk circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also DID-TRK (Direct Inward Dial Trunk) on page 695 for related trunk information.

DID-DS1 (Direct Inward Dial Trunk)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
DID-DS1	MAJOR[1]	**test trunk *grp/mbr* long**	Direct Inward Dial Trunk
DID-DS1	MINOR	**test trunk *grp/mbr* long**	Direct Inward Dial Trunk
DID-DS1	WARNING	**test trunk *grp/mbr***	Direct Inward Dial Trunk

1 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed. For more information, see the **set options** command.

The DID-DS1 trunk provides a digital Direct Inward Dial (DID) trunk from a CO switch to the system through a DS1 link. A 24-channel DS1 link can support up to 24 DID-DS1 trunk calls simultaneously. A 32-channel link can support up to 30.

A DID-DS1 trunk can be used for digitized voice and data communications with DS1 signaling mode (for example, common-channel signaling). The TN767 and TN464 series circuit packs, and the MM710 Media Module, support wink-start and immediate-start trunks and Avaya™ Communication Manager signaling. Throughout this section, the term DS1 applies to all. For more information, see one of the following maintenance objects:

Circuit Pack/Media Module	Maintenance Object
TN767 DS1 Interface Circuit Pack	DS1-BD
TN464 UDS1 Interface Circuit Pack	UDS1-BD
S8300 / **G700**: MM710 DS1 Media Module	MG-DS1

S8300 / **G700**: Although the DID-DS1 MO is provided for a G700 Media Gateway, this MO only partially supports the MM710 DS1 Media Module.

Information included in this section covers the in-line errors log, initialization tests, periodic tests, scheduled tests, system technician demand tests, and alarms escalation and elimination. Two trunk service states are specified in the DID-DS1 trunk maintenance:

out-of-service	The trunk is in a deactivated state and cannot be used for incoming calls.
in-service	The trunk is in an activated state and can be used for incoming calls.

If a DS1 is out-of-service, then every trunk on the circuit pack or media module is put into the out-of-service state, and a Warning alarm is raised.

Error Log Entries and Test to Clear Values

Table 288: DID-DS1 Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test trunk *grp#/mbr#***
1 *	Any				
15 *	Any	Port Audit and Update test (#36)			
18 *			WARNING	OFF	**release trunk *grp#/mbr#***
130 *		None	WARNING	ON	**test trunk *grp#/mbr#***
257 *	57474 57473				
513 *	57392		MAJOR MINOR[2]		
769 *	57393		MAJOR MINOR[2]		
1281		Conference Circuit test (#7)	MINOR WARNING[3]	ON	**test trunk *grp#/mbr#* l r 4**
1537		NPE Crosstalk test (#6)	MINOR WARNING[3]	ON	**test trunk *grp#/mbr#* l r 3**
1793 *					**test board <*address*> l**
2305 *	50944	None	MAJOR MINOR[2]	OFF	
3840 *		Port Audit and Update test (#36)			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

2 This alarm will only be raised when the System-Parameter Country screen has the `Base Tone Generator` field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

3 Major alarms may be downgraded to Warning alarms based on the value used in the set options command.

NOTE:
For information on a specific **<*address*>**, refer to Command Syntax on page 179.

Error Additional Information:

Error Type 1: DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. The `Aux Data` field indicates the following:

57476	On-hook before wink
57477	On-hook before ready to receive digits
57485	Wink too short for valid signal

Maintenance does not start any testing or generate any alarms in response to these errors.

Error Type 15: This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate errors (if any).

Error Type 18: The trunk has been taken out of service by a demand busyout. No calls can be made on this trunk.

Error Type 130: This error type indicates that the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 257: DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. The `Aux Data` field indicate the source of the error:

57474	Rotary dial rate above 12 pulses per second
57473	Rotary dial rate below 8 pulses per second

Error Type 513: DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. Aux Data 57392 indicates no external release on PBX disconnect.

Error Type 769: DS1 Interface circuit pack or media module detects a hardware error on the DS1 DID trunk. Aux Data 57393 indicates belated external release on PBX disconnect.

Error Type 1793: DS1 Interface circuit pack or media module is out-of-service. Look in the Hardware Error Log:

If port is on	Look in
TN767 DS1 Board	DS1-BD
TN464 UDS1 Board	UDS1-BD
S8300 / **G700**: MM710 DS1 Media Module	MG-DS1

Error Type 2305: This error indicates that a signaling change was detected by the PBX trunk circuit pack or media module which is inconsistent with the present state of the trunk.

Error Type 3840: Port Audit and Update test (#36) failed due to an internal system error. Enter **status trunk** to verify the status of the trunk. If the trunk is out-of-service, enter **release trunk** to put it back to in-service. Retry the test command.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the following table. By clearing error codes associated with the *NPE Crosstalk* test, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Conference Circuit test (#7) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Port Audit and Update test (#36)	X **S8100**: (blank)	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 289: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/ member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for Error Type #1025. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of- service due to TDM BUS error. Use **status health** to determine whether the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Issue **list measurements tone-receiver** to display information about the tone receivers. **2** Resolve any TTR-LEV errors. **3** Resolve any TONE-PT errors. **4** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or circuit pack and attempt to diagnose the previously existing error.

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Table 289: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack (DS1-BD or UDS1-BD): 1281 – Loss of signal, 1793 – Blue Alarm, 2049 – Red Alarm, 2305 – Yellow Alarm, or 1537 – Hyperactivity **1** Resolve any of the previous error types.
ANY	FAIL	This can be due to off-board problems, including EXP-PN and EXP-INTF faults, RMC-ENV faults (**S8700 IP**), TDM-BUS faults, and Tone Detectors/Tone Generators. Clear every off-board problem before replacing the board. A TDM-BUS problem is usually a faulty board or bent pins on the backplane. **1** Resolve any EXP-PN, EXP-INTF, RMC-ENV (**S8700 IP**), TDM-BUS, TONE-BD, and TONE-PT errors in the error log. **2** Retest when errors are cleared. Replace the board if the test fails.
	PASS	The port is correctly using its allocated time slots. Investigate user-reported troubles on this port using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port. This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board translations are correct. Use **list config,** and resolve any problems that are found. **2** Issue **busyout board <*address*>**. Issue **reset board <*address*>**. Issue **release board <*address*>**. **3** Issue **test board <*address*> long**. This should re-establish the link between the internal ID and the port. If not, check to see that there is a valid board inserted.

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Conference Circuit Test (#7)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together.

Table 290: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for Error Type #1025. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Issue **list measurements tone-receiver** to display information about the tone receivers. **2** Resolve any TTR-LEV errors. **3** Resolve any TONE-PT errors. **4** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Issue **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.

Table 290: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	The test was disabled via translation. Determine why the test has been disabled before you enable it. **1** Verify that the `Maintenance Test` field on the ***Trunk Administration*** form is set to **n**. To enable the test, change the trunk administration and enter **y** for this field. **2** Repeat the test.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack (DS1-BD or UDS1-BD): 1281 – Loss of signal, 1793 – Blue Alarm, 2049 – Red Alarm, 2305 – Yellow Alarm, 1537 – Hyperactivity **1** Resolve any of the previous error types.
Any **S8100**: (blank)	FAIL	The NPE of the tested port did not conference the tones correctly. This can cause noisy and unreliable connections. **1** Enter **list configuration board <*address*>**. The circuit pack must be a TN767C V3 or later. The error log may have Error Type #1281. **2** Test every administered trunk on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. **3** If every port fails, a -5V power problem is indicated. Check CARR-POW (Carrier Power Supply). **S8100**: Check CAB-PFL (Power Fan Lead). **4** If several ports fail, resolve any TONE-BD (Tone-Clock Circuit) or TONE-PT (Tone Generator) errors and rerun the test. **5** If the retry passes and troubles are reported, coordinate isolation with the CO. Make sure that the switch, the CO, and any NTCE equipment (the CSUs) have the correct administration. **6** Replace the circuit pack.

Table 290: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	PASS	The port can correctly conference multiple connections. Investigate user-reported troubles on this port using other port tests and by examining station, trunk, or external wiring. **S8100**: This test always passes for TN742 Analog circuit packs prior to Vintage 4.
0	NO BOARD	The test could not relate the internal ID to the port. This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **lIst config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board <*address*>**. **3** Issue **reset board <*address*>**. **4** Issue **release board <*address*>**. **5** Issue **test board <*address*> long**. This should re-establish the link between the internal ID and the port. If not, check to see that there is a valid board inserted.

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Port Audit and Update Test (#36)

This test sends port-level translation data from the switch processor to the DS1 Interface circuit pack or media module to assure that a trunk's translations are correct. The port audit operation verifies the consistency of the current state of the trunk as kept in the DS1 Interface circuit pack or media module and in switch software.

Table 291: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	The port may be busy with a valid call. **1** Issue **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for Error Type #1025. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1006	ABORT	The test was aborted because the trunk is out of service. **1** Use **status trunk** to verify that the trunk is out of service. **2** If the trunk is out of service, determine why. **3** To put the trunk back in service, issue **release trunk**. Retry the test.
2000	ABORT	Response to the test was not received in the allowable time period.
2100	ABORT	Could not allocate resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Test failed due to internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 291: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit packor media module and switch software are consistent. If the trunk is busied out, the test will not run but will return PASS. To verify that the trunk is in-service: **1** Enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service. **2** Enter **release trunk** to put the trunk back into in-service. **3** Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board <*address*>**. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*> long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

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DID-TRK (Direct Inward Dial Trunk)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DID-TRK	MAJOR[2]	**test port *location* l**	DID Trunk
DID-TRK	MINOR	**test port *location* l**	DID Trunk
DID-TRK	WARNING	None	DID Trunk

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506,* for information about how to administer trunks. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

S8100

Direct Inward Dial (DID) trunks coming from the Central Office (CO) allow outside parties to call directly to an extension in the system. DID Trunk circuit packs include:

TN753	United States
TN2146	Belgium and the Netherlands
TN2139	Italy
TN 436	Australia
TN459	United Kingdom

DID trunk circuit packs and the MM711 Media Module support eight incoming-only ports. Each port provides an interface between the 2-wire analog CO line and the 4-wire TDM bus on the switch.

S8300 / **G700**: Although the DID-TRK MO is provided for a G700/G350 Media Gateway, this MO only partially supports the MM711 Analog Media Module.

DID Trunk Operation

The DID port receives three to five digits from the CO that are used to directly connect an outside caller to the called station without assistance from an attendant. For each call, the CO switch signals the system by opening and closing individual DID loops (one of the eight ports), causing the starting or stopping of loop current.

DID Trunk Testing

The system uses technician-invoked tests of on-board circuitry to diagnose the health of the trunk. These are described in the following sections. Additionally, in-line testing which can generate errors, is performed while a call is in progress. See the Error Log table for a description of these errors. These errors may be reproduced by placing a call on the trunk and checking the Hardware Error Log.

Problems detected during signaling may be caused by off-board faults in the CO switch or connections for which a Warning alarm is raised.

Before a maintenance test can be run on a port, the port must be idle. If an incoming call seizes a port that is being tested, the test will abort and the incoming call will proceed.

For transmission and signaling standard specification, refer to *Digital PBX Standards, RS4648*.

Ports Out-of-Service without Errors or Alarms

A common trouble on DID trunks that produces no errors or alarms occurs when the CO busies out (disconnects) the port. This situation occurs when the CO thinks there are problems with the DID port. In this case, no incoming calls will be possible through this port. This may result in complaints from outside callers trying unsuccessfully to call in. This problem can be diagnosed by listing measurements on lightly used trunks. If a particular port is detected as idle, a call to the CO will be necessary to get the connection back in service.

Error Log Entries and Test to Clear Values

Table 292: DID Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port <*address*> sh r 1**
1 *	Any	None	WARNING	OFF	
1 *	57476	None	WARNING	OFF	
1 *	57477	None	WARNING	OFF	
1 *	57483	None	WARNING	OFF	
15 *	Any	Port Audit Update (#36)			
18	0	**busyout trunk *grp/mbr***	WARNING	OFF	**release trunk *grp/mbr***
130 *		None	WARNING	ON	**test trunk *grp/mbr***
257 *	57472	None	WARNING	OFF	

Table 292: DID Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
257 *	57473	None	WARNING	OFF	
257 *	57474	None	WARNING	OFF	
257 *	57475	None	WARNING	OFF	
513 *	57392	None	MINOR WARNING[2]	OFF	
510 *	57393	None			
769	Any	Port Diagnostic (#35)	MINOR WARNING[2]	ON	**test port <*address*> r 3**
1025		Looparound and Conference (#33)	MINOR WARNING[2]	ON	**test port <*address*> l r 3**
1281		NPE Crosstalk (#6)	MINOR WARNING[2]	ON	**test port <*address*> l r 3**
1537	Any	Port Diagnostic (#35)	MAJOR MINOR WARNING[2]	OFF	**test port <*address*> r 3**
1793 *	57489	None	None		

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

2 Major alarms may be downgraded to Warning alarms based on the value used in the set options command.

NOTE:
See also the preceding section on trunk problems without errors or alarms.

Error Additional Information:

Error Type 1; Aux Data - Any: This condition occurs when the tone detector times out waiting for digits. Change wink/immediate-start parameter to wink/immediate-start and rotary/tone-dial parameters.

1 Verify trunk administered wink/immediate-start parameter.

2 Test trunk using BUTT set.

3 Refer problem to CO.

Error Type 1; Aux Data - 57476: Rotary dial before wink — This condition occurs when the CO starts dialing before the PBX sends wink on a wink-start trunk.

1 Verify trunk administered wink/immediate-start parameter.

2 Refer problem to CO.

Error Type 1; Aux Data - 57477: Rotary dial too early — This condition occurs when the CO starts dialing too soon after seizure on an immediate-start trunk.

1 Verify trunk administered wink/immediate-start parameter.

2 Refer problem to CO.

Error Type 1; Aux Data - 57483: Rotary dial pulse during wink — This condition occurs when the CO sends rotary dial digits too soon after seizure on a wink-start trunk.

1 Verify trunk administered wink/immediate-start parameter.

2 Refer problem to CO.

Error Type 15: This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors (if any).

Error Type 130: This error type indicates that the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 257; Aux Data - 57472: Rotary dial pulse on-hook longer than 105 msec — Break between rotary pulses is too long.

1 Test trunk by performing an incoming test call.

2 Refer problem to CO.

Error Type 257; Aux Data - 57473: Rotary dial rate below 8 pulses/sec — More than 135 msec between two successive breaks.

1 Verify trunk administered interdigit-timing parameters.

2 Refer problem to CO.

Error Type 257; Aux Data - 57474: Rotary dial rate above 12 pulses/sec — Less than 75 msec between two successive breaks.

1 Verify trunk administered interdigit-timing parameters.

2 Refer problem to CO.

Error Type 257; Aux Data - 57475: Digit detection — CO is starting new rotary dial digit within 150 msec of previous digit.

1 Verify trunk administered interdigit timing parameters.

2 Refer problem to CO.

Error Type 513; Aux Data - 57392: Loop current active — CO not releasing trunk after PBX disconnect. Occurs when the PBX end drops first and the CO does not release the trunk within 4 minutes.

1 Verify the interface to the network with a hand telephone set. If calls are placed correctly, then refer problem to the CO.

2 If unable to place calls or this equipment is not available, check the status on port using the **status trunk** command. If active but not connected, disconnect bridging clips at the network interface. Check status on the trunk. If trunk went idle, then replace clips. If trunk is still active but unable to place calls, refer problem to the CO.

Error Type 513; Aux Data - 57393: Late CO trunk release — This event only occurs after the occurrence of Error Type 513. The CO released the trunk 4 minutes after the PBX dropped the call. This event decrements the severity (error count) of Error Type 513, or may mean the problem related to Error Type 513 has been fixed.

Verify that Error Type 513 does not occur again. Refer to Error 513.

Error Type 1793: Incomplete Dial timer expired. This error only applies to the TN459 and indicates a problem with incoming dialing stream. Refer the problem to the CO.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. By clearing error codes associated with the *NPE Crosstalk* test for example, you may also clear errors generated from subsequent tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8300 / G700:** This test aborts with Error Code 1412.		X	ND
Port Diagnostic test (#35)	X	X	ND
Looparound and Conference Circuit test (#33) **S8300 / G700:** This test aborts with Error Code 1412.		X	ND
Port Audit Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

NOTE:
S8300 / G700: This test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot on the TDM bus and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 293: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources for this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Enter **display port <*address*>** to determine the station extension, attendant number, or trunk group/member number of the port. Enter **status station**, **status attendant**, or **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is active but the port is idle (no calls), check the Error Log for Error Type 513. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of- service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** Enter **display port <*address*>** to determine the station extension, attendant number, or trunk group/member number of the port. Enter **status station**, **status attendant**, or **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** Retry the command at 1-minute intervals up to 5 times.
S8300 / G700: 1412	ABORT	This test does not execute on a G700 media gateway.

Table 293: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources for this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	This test can fail due to off-board problems, including EXP-PN and EXP-INTF faults RMC-ENV faults (**S8700 IP**), TDM-BUS faults, and Tone Detectors/Tone Generators. Clear every off-board problem before replacing the board. A TDM-BUS problem is usually a faulty board or bent pins on the backplane. **1** Resolve any EXP-PN and EXP-INTF, RMC-ENV (**S8700 IP**), TDM-BUS, TONE-BD, and TONE-PT errors in the error log. **2** Retest the board. Replace the board if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*>** command. This should re-establish the linkage between the internal ID and the port.

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Looparound and Conference Circuit Test (#33)

NOTE:
S8300 / G700: This test aborts with Error Code 1412.

This test checks the reflective and non-reflective loop-around and conference capabilities of a DID port circuit. The test that uses 404-, 1004-, and 2804-Hz tones is an on-board test only. Each tone is separately transmitted to and from the port (loop around within the port) and verified.

This test may fail due to noise induced by adjacent electric power lines. Resolve this problem with the local power company. To temporarily alleviate the alarm caused by the failure of this test, disable the test from the trunk administration `Test` field. This also disables the port diagnostic test.

Table 294: Test #33 Loop-Around and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	System resources required to run this test are not available. The seized tone detector did not respond. This abort code is usually associated with tone-clock (TONE-BD, TONE-PT, and TDM-CLK) resources. **1** Clear any tone errors in the error log. **2** Retry the command a 1-minute intervals up to 5 times. **3** If the test continues to abort, escalate the problem.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Enter **display port <*address*>** to determine the station extension, attendant number, or trunk group/member number of the port. Use **status station**, **status attendant**, or **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is active but the port is idle (no calls), check the Error Log for Error Type 513. The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** Enter **display port <*address*>** to determine the station extension, attendant number, or trunk group/member number of the port. Use **status station**, **status attendant**, or **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook), if the handset is plugged in and the port is not busied out. **2** Retry the command at 1-minute intervals up to 5 times.

Table 294: Test #33 Loop-Around and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	Test disabled by administration. Verify that the `Maintenance Tests?` field on the ***Trunk Group*** form is set to **n**. To enable the test, issue the **change trunk-group <*x*>** command (**<*x*>** is the trunk group number). Then change the entry in the `Maintenance Tests?` field to **y**.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. This may be due to the port being seized. **1** This abort code is usually associated with tone-clock (TONE-BD, TONE-PT, and TDM-CLK) resources. Clear any tone errors in the error log. **2** Retry the command at 1-minute intervals up to 5 times.

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Table 294: Test #33 Loop-Around and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
3	FAIL	The nonreflective 1004-Hz tone test of the port failed. An echo was detected from the port. Poor-quality transmission was detected to or from the port. The problem may be off-board.
7		The conference capabilities of the port failed. Poor-quality transmission was detected to or from the port. The problem may be off-board.
129		The reflective 404-Hz tone test failed. Poor-quality transmission was detected to or from the port. The problem may be off-board.
131		The reflective 1004-Hz tone test failed. Poor-quality transmission was detected to or from the port. The problem may be off-board.
133		The reflective 2804-Hz tone test failed. Poor-quality transmission was detected to or from the port. The problem may be off-board. **CAUTION:** The port may still be operational, or the fault may be off-board (connections or CO). Off-board problems include incoming seizures or off-hook port seizures during the test and, perhaps, noise induced by adjacent electric power lines. The test may be disabled from trunk administration 'Test' field. This turns off all testing for that trunk group except for tests 6 and 36.

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Table 294: Test #33 Loop-Around and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
3 7 129 131 133 *(cont'd)*	FAIL *(cont'd)*	Proceed as follows unless power or tone problems are suspected (see following note). **1** To see if the problem is on-board, disconnect the port from the far end, and retry the test. Coordinate this with the CO, or do it after busy hours. **2** If the retry fails, replace the circuit pack. **3** If the retry passes and no troubles have been reported, disable the test in the trunk group administration. If the retry passes and troubles are reported, coordinate isolation with the CO. If the loop-around and conference circuit test fails for every port on a circuit pack, a -5V power problem is indicated. A power unit may be defective (CARR-POW (Carrier Power Supply)). If the test fails on more than 1 port, check for errors on the TONE-BD (Tone-Clock Circuit) or the TONE-PT (Tone Generator) MOs. **1** Rerun the test.
	PASS	DID Trunk Looparound and Conference test is successful. This port is functioning properly. **1** If users are reporting troubles, examine loop connections to the port and refer problem to the CO.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*>** command. This should establish the link between the internal ID and the port.

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Port Diagnostic Test (#35)

This test checks a port's battery feed circuitry for on-/off-hook detection, battery shutdown, and battery reversal (wink) capabilities.

Table 295: Test #35 Port Diagnostic Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required to run this test were not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Enter **display port <_address_>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for Error Type 513. The port may be locked up. **3** If the port status is idle, busyout and release the trunk, and retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, check for wiring errors toward the CO which may cause the trunk to lock up. **5** If the wiring is good and the test continues to abort, replace the circuit pack or media module.
1004	ABORT	The port was seized by a valid call during the test. **1** Enter **display port <_address_>** to determine the station extension, attendant number, or trunk group/member number of the port. Use the **status station**, **status attendant**, or **status trunk** command to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled via administration. Verify that the `Maintenance Tests` field on the ***Trunk Group*** form is set to **n**. To enable the test, issue **change trunk-group <_x_>,** where **<_x_>** is the trunk group number. Change the entry in the `Maintenance Tests` field to **y**.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
61446	FAIL	Battery feed test failed. A loop current fault was detected. This is most probably an incoming CO-line problem. This failure code is only reported by the TN2139 Italian DID circuit pack. **1** Check the incoming CO-line for loop current. If none is detected refer the problem to the CO. **2** If the CO-line checks out OK, the failure must be on the DID port. Replace the circuit pack.

Table 295: Test #35 Port Diagnostic Test

Error Code	Test Result	Description / Recommendation
61456	FAIL	Battery feed test failed. An on-board problem was detected. This port is out-of-service. **1** Replace the circuit pack or media module.
61472	FAIL	Battery feed test failed. A problem with the incoming CO-line was detected. **1** Check the incoming CO-line for proper operation. If warranted, refer the problem to the CO. **2** If the CO-line is not at fault, the failure must be on the DID port. Replace the circuit pack or media module.
	PASS	Current flow was detected for this port. **1** User-reported troubles on this port should be investigated using other port tests and by examining connections. **2** Refer problem to the CO.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board if necessary. **2** Issue the **busyout board <*address*>** command. **3** Issue the **reset board <*address*>** command. **4** Issue the **release board <*address*>** command. **5** Issue the **test board <*address*>** command. This should re-establish the linkage between the internal ID and the port.

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Port Audit Update Test (#36)

This test sends updates of the DID port translation for every port on the circuit pack or media module that has been translated. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack or media module. No response message is expected from the circuit pack or media module once it receives translation updates. The port translation data includes:

- Wink or immediate start trunk
- Dial tone or rotary dialing trunk
- Rotary dialing inter-digit timing
- Network balance R/RC
- Disconnect timing

Table 296: Test #36 Port Audit Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1006	ABORT	The port is out of service, perhaps busied out. **1** Use **display port <_address_>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is out of service, wait until the port is in service and idle before testing. **2** If the port status is in service and idle, then retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run the test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	This test passed. Translation information was successfully updated on the circuit pack or media module. **1** If signaling troubles are reported (Error Types 1, 257, or 513), verify translation for this port. **2** Refer problem to the CO. **S8100**: If the trunk is busied out, the test does not run, but returns PASS. To verify that the trunk is in-service: **1** Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. **2** Enter **release-trunk** command to put trunk back into in-service. **3** Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port. **1** Verify that the board's translations are correct. Translate the board if necessary. **2** Issue the **busyout board <_address_>** command. **3** Issue the **reset board <_address_>** command. **4** Issue the **release board <_address_>** command. **5** Issue the **test board <_address_>** command. This should re-establish the linkage between the internal ID and the port.

DIG-BD (Digital Line Circuit Pack)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DIG-BD	MINOR	**test board *location* sh**	Digital Line circuit pack
DIG-BD	WARNING	**test board *location* sh**	Digital Line circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also DIG-LINE (Digital Line) on page 716 in this chapter for related line information.

NOTE:
The separate, but equivalent, MG-DCP MO can reside in slots 1–4 of a G700 media gateway. Refer to MG-DCP (Digital Line Media Module) on page 1254 for information about G700 MOs.

DIG-IP-STN (Digital IP Station)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
DIG-IP-STN	WARNING	**test station *extension***	Digital IP Station

The DIG-IP-STN MO represents Softphone and Avaya 46XX phones. Softphone has some DCP maintenance capability in the form of audits, updates, error log entries, and test to clear values. Avaya 46XX IP phones communicate to the switch via an IP LAN and emulate DCP signaling carried over TCP.

The IP phone is not attached to a port board. Insertion of the phone is driven by successful registration of the endpoint, not by board insertion. It is maintained via a set of explicit TCP/IP ping requests and errors reported by the User Manager software, which terminates the H.323 signaling portion of each endpoint. The MO follows standard maintenance methodology and supports **test**, **busyout**, **release** and **status** commands.

A registered extension has a port number or ID in the form of S*NNNNN*, where *N* is a digit from 0–9. This ID indicates that the extension is a virtual port and a station.

NOTE:
A port number or ID of SNNNNN does not necessarily indicate that the extension is registered. A registered extension retains the S*NNNNN* port number or ID, even if the extension later unregisters.

Maintenance for Softphone includes Error Log Entries and Test to Clear Values.

Table 297: DIG-IP-STN Digital IP Station Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		**test station *extension***
1 (a)		Registration Status Inquiry (#1372)	WARNING	OFF	
18 (b)	0	**busyout port | station**	WARNING	OFF	**release port |station**
257 (c)		Signaling Path PING test (#1373)	WARNING	OFF	
(d)		Digital Terminal Lamp Update (#16)	WARNING	OFF	
(e)		Digital Terminal Audit Update (#17)	WARNING	OFF	
513 (f)	Any	Station Digital AUDIT test (#17)	WARNING	OFF	**test port | station**
1281 (g)	Any	Station Digital AUDIT test (#17)	WARNING	OFF	**test port | station**

Table 297: DIG-IP-STN Digital IP Station Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1537 (h)	4096 8		WARNING	OFF	**test port | station**
2305 (i)	Any	None			
2817 (j)		Station Hyperactivity			

Error Notes:

a **Error Type 1** — This error reports the registration status of the endpoint. If Communication Manager software claims the endpoint is registered and receives keep-alive handshakes from the endpoint, the test passes. If keep-alive handshaking has failed, the test fails. If the user has intentionally un-registered from the S8700 media server, the station is now basically an AWOH station and is no longer being maintained; no tests run for this station.

b **Error Type 18** — This error type is logged when the port/station is busied out by maintenance personnel. Make sure the port/station is released from busy via the **release port | station** command (IP terminal only).

c **Error Type 257** — This error tracks failures of the signaling path PING test. The test attempts to send a PING packet to the endpoint IP address, as reported during registration. The PING packet originates with the C-LAN board through which the endpoint is registered. If the PING response packet is received, the test passes. If the PING response packet times out, the test fails.

d This refreshes the lamp state of every lamp on a virtual DCP station. If successful, the update always passes. It can abort, but it never fails. This update (test number 16) is the same one used for existing DCP stations.

e This refreshes the ringer state on a virtual DCP station and queries the virtual station's switch-hook state. If successful, the update always passes. It can abort, but it never fails. This runs a subset of the entire audit update that runs for standard DCP sets.

f **Error Type 513** — This error type indicates that the terminal failed to respond to the ID Query request. This implies that there is something wrong with the terminal or the communication path. (IP terminal only).

g **Error Type 1281** — This error type indicates that the terminal is reporting a bad state of health (IP terminal only).

h **Error Type 1537** — This error type indicates that the link has gone down between the terminal and its gateway to the switch. This likely means that the terminal has unregistered (IP terminal only).

i **Error Type 2305** — This error indicates that there was an unsolicited Link Reset even though switch software believed the terminal to be functional and in service. This error can be ignored if no user complaints are received (IP terminal only).

j **Error Type 2817** — This error tracks failures of the port hyperactivity counter. If a port generates more than 50 uplink CCMS messages within 10 seconds, the port is taken out-of-service for 30 seconds. Even though the Softphone actually signals over a TCP/IP link, DCP CCMS messages received over the TCP link are counted as regular CCMS uplinks and can cause the station to be marked as hyperactive.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the Signaling Path PING test, for example, you can also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Registration Status Inquiry (#1372)	X	X	ND
Signaling Path PING Test (#1373)	X	X	ND
Digital Terminal Lamp Update Test (#16)	X	X	ND
Digital Terminal Audits Test (#17)		X	ND

1 D = Destructive; ND = Nondestructive

Registration Status Inquiry (#1372)

The Registration status inquiry reports the H.323 registration status of the endpoint. An endpoint must be registered and authenticated in order to receive service from the system.

Registration is initiated when the endpoint user attempts to login using the Avaya registration software application running on the endpoint PC. The user must provide a valid extension and security code. The registration messages are sent to the IP address of a C-LAN's Ethernet port.

A registered extension has a port number or ID that appears as SNNNNN, where N is a digit from 0–9 and is an indication that the port is virtual and a station.

Table 298: Test #1372 Registration Status Inquiry

Error Code	Test Result	Description / Recommendation
1, 2, 3	FAIL	The endpoint is not successfully registered. **1** Verify that the user is entering the: • Correct extension and security code • C-LAN's IP address **2** Verify that the extension has been enabled for IP softphone operation. **3** If many endpoints cannot register, investigate any errors of the C-LAN's Ethernet port. **4** Examine the Ethernet cabling from the endpoint PC to the Ethernet hub.
	PASS	The endpoint is successfully registered and continues to respond to registration handshaking.

Signaling Path PING Test (#1373)

This test is **non**destructive.

The test determines the local C-LAN through which the signaling originates and the endpoint's IP address. It then requests the local C-LAN to execute a PING on the endpoint's address. If the PING is successful, the test passes, if the PING is not successful, the test fails.

NOTE:
Multiple failures of this test can take the Digital IP Station out of service.

This test checks the circuitry involved in the data path of a peer-to-peer IP layer connection.

NOTE:
This nondestructive test runs due to in-line errors, during periodic and schedule maintenance, and on demand.

Table 299: Test #1373 Signaling Path PING Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
1003	FAIL	Ping to the destination failed. **1** Retry the command at 1-minute intervals up to 3 times. **2** Investigate any errors of the C-LAN's Ethernet port.
1007	FAIL	The system could not PING the registered endpoint via the C-LAN. **1** Verify that at least one destination reachable through this port. PING this destination (**ping ip-address *xxx.xxx.xxx.xxx***). **2** If a PING to any destination is successful through this port, the link is up. **3** If PING to every destination fails, test the C-LAN port (**test port *UUCSSpp* short**), and follow repair procedures for Session Status test (#1286) failures. **4** If only this station cannot be pinged: • Make sure the PC is up. • Make sure the PC has a network connection (Ethernet or dial-up). • Check the Ethernet cabling.
	PASS	The system can successfully send IP packets to the registered endpoint from the C-LAN.

Digital Terminal Lamp Update (#16)

This test updates internal lamp states that can or cannot be shown on the actual PC graphical user interface. The lamp updates run only if the station is in-service. The status of the station is checked and the lamp updates are blocked from taking place if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

Table 300: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1	ABORT	This port could have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via **release station *extension*** and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	Station could be in ready-for-service or out-of-service state. **1** Use **status station** to verify state of station. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port could be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The message to light every station lamp was successfully sent to the port.

Digital Terminal Audits Test (#17)

This is a series of tests that are classified as audits. The media server sends messages to the softphone application or IP phone to perform the following tests. These audits run only if the station is in-service.

- Switchhook Inquiry test — This updates the media server's records according to the softphone switch-hook state.
- Ringer Update test — This updates the softphone's ringer state according to the media server's records.
- ID Request — This queries the station for its status. The terminal returns its configuration information and health information. The information is checked, and a PASS/ABORT result is provided. If the result is ABORT, an error is logged in the hardware error log (IP terminal only).

Table 301: Test #17 Station (Digital) Audits Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Switchhook audit timed out.
2	ABORT	ID request fails, health bit returned from voice terminal is bad (IP Terminal only). **1** Make sure voice terminal is connected, and repeat test. **2** If test fails, replace the voice terminal, and repeat test.
4	ABORT	Internal system error **1** Resolve any outstanding circuit pack maintenance problems. **2** Retry the command at 1-minute intervals up to 5 times.
5	ABORT	Ringer update aborted due to station being in ready-for-service or out-of-service state.
6	ABORT	This port could have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error is present, then release the port via **release station *extension***. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Station Audits passed. **1** If complaints persist, investigate by using other port tests, and by examining the station, wiring, and connections.

DIG-LINE (Digital Line)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DIG-LINE	MINOR	**test port *location* l**	Digital Line
DIG-LINE	WARNING	**test port *location* sh**	Digital Line

1 For information on specifying a ***location***, see Command Syntax on page 179.

DIG-LINE monitors and tests ports on digital line circuit packs or digital line media modules and on hardware administered as a digital station on those ports. These include stations with only a digital phone and stations with a digital phone linked to a data module.

S8700 / S8500 / S8100

Standalone data modules, and data adaptors in standalone mode, are covered by the PDMODULE (Processor Data Module) TDMODULE (Trunk Data Module) MOs. Circuit pack-level maintenance is covered by DIG-BD (Digital Line Circuit Pack) on page 709, the strategy for which is described in XXX-BD (Common Port Circuit Pack/Media Module).

S8100

The following circuit packs support digital lines:

Table 302: Digital Line Circuit Packs

Code	Ports	Type	Companding	Endpoints
TN754	8	4-wire DCP	mu-law	7400 series digital voice terminals, attendant consoles, 510D personal terminals, MT515 BCTs, DCP data modules
TN754B	8	4-wire DCP	A-law/mu-law	
TN2181	16	2-wire IDCP	A-law/mu-law	
TN2224B/CP	24	2-wire IDCP	A-law/mu-law	
TN2136	8	2-Wire IDCP	A-law/mu-law	Data Adaptors (DA), Italtel Digital Telephone Models 1 and 2 (IDT1/2).
TN2181	16	2-wire IDCP	A-law/mu-law	
TN2224B/CP	24	2-wire IDCP	A-law/mu-law	

Each digital line port supports two 64 kbps information channels (primary and secondary) and one 8kbps signaling channel. Digital voice terminals always use the primary information channel. Thus only one voice terminal can be connected to each port. The secondary information channel can be used to connect a data terminal via a Digital Terminal Data Module (DTDM) or a Data Adaptor (DA). All other devices currently supported by Digital Line circuit packs communicate on the primary information channel. Figure 45, Digital Line Connectivity, on page 717 shows examples of digital line connectivity.

Only the TN754B or TN2136 circuit packs should be used in out-of-building applications. For important information pertaining to protection required for out-of-building digital voice terminals, refer to *Avaya™ Communication Manager, Avaya DEFINITY® Servers and Avaya™ S8100 Media Server Library, 555-233-823*.

It should be noted that TN2181 and TN2224B/CP support both modes as shown in Figure 45, Digital Line Connectivity, on page 717 and Figure 46, Digital Line Connections, on page 718.

Figure 45: Digital Line Connectivity

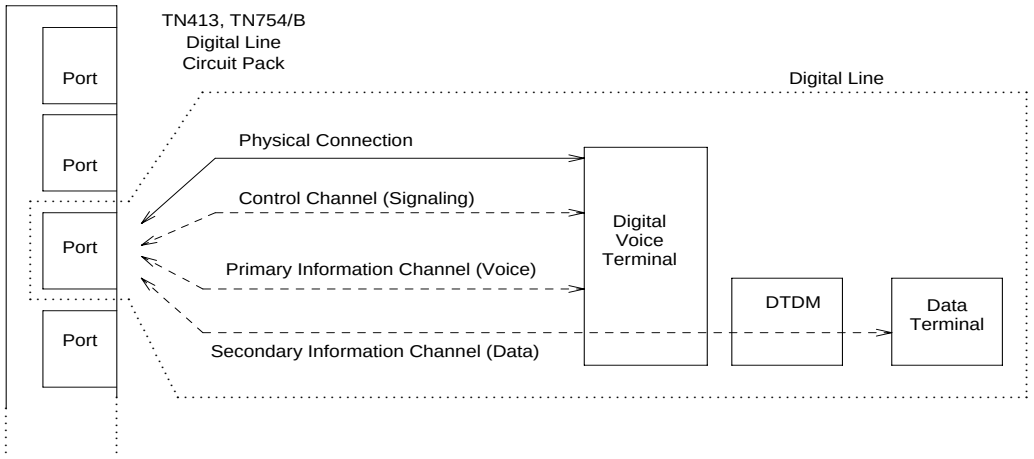
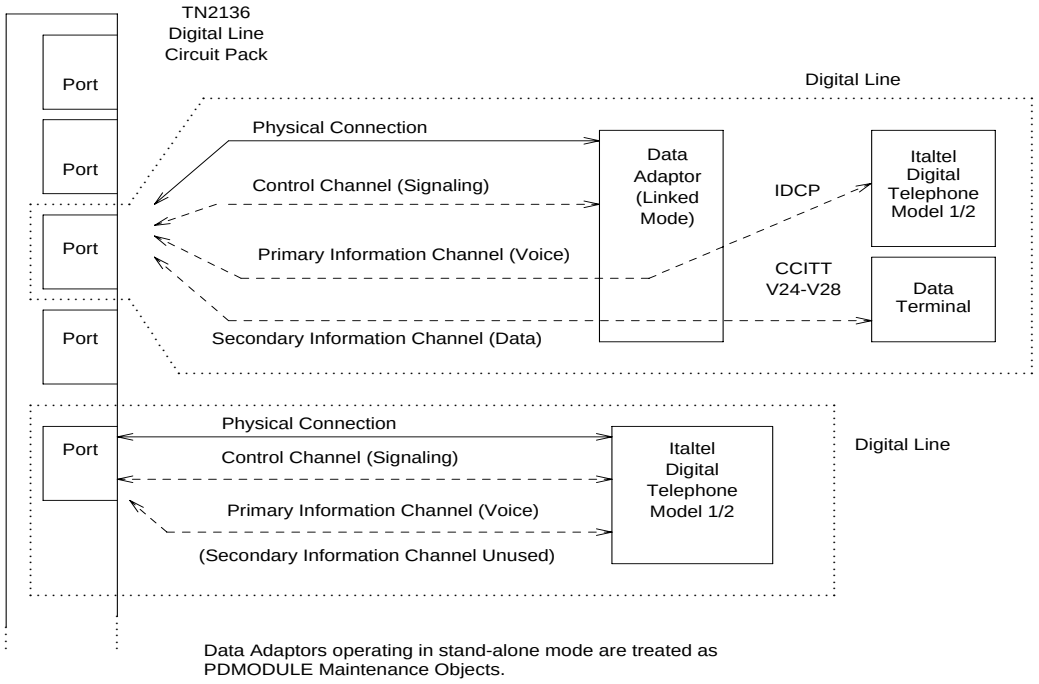


Figure 46: Digital Line Connections



Only 2-wire Italtel Digital Telephone Models 1 and 2 (IDT1/2) or DAs can directly connect to a TN2136 circuit pack. Avaya DCP (4-wire) digital voice terminals and data modules can connect to these circuit packs via Italtel's 2/4-wire adapter. DAs can operate in either of two modes, and they are covered by different MOs:

DA Mode	Administered as:	Endpoint	MO
Standalone	PDM	Data endpoint only	PDMODULE
Linked	DTDM	IDT1/2 and optional data terminal	DIG-LINE

S8300 / G700

Media Gateway-level maintenance is covered by MG-DCP (Digital Line Media Module), the strategy for which is described in XXX-BD (Common Port Circuit Pack/Media Module).

NOTE:
Although the DIG-LINE MO is provided for a G700 media gateway, this MO only partially supports the G700's MM712 DCP media module.

Service States

Digital line maintenance interacts with digital line circuit pack (DIG-BD), or with digital line media module (MG-DCP) maintenance. The health of the digital-line circuit pack or media module can affect the results of DIG-LINE testing. Keep this in mind when investigating digital-line problems.

There are instances where it is important to know the service state of a station. The different service states that apply to digital-line stations are explained as follows:

Out-of-Service state	The port, and thus the station, have been removed from service. Busyout puts the port in the out-of-service state.
Ready-for-Service state	The port on the circuit pack or media module has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service state	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally. It can also be forced into the in-service state by going off-hook.

Downloading Terminal Parameters

The following information explains how maintenance software interacts with terminal parameter downloading.

For Systems Supporting Circuit Packs

Terminal Types:

The software can interact with the following terminal types:

- 84xx multibutton digital voice terminals (8403D01A, 8410B, 8410D02A, 8434D01A) with optional expansion module.
- 603A1 and 603D1 Callmaster terminals for telemarketing applications.
- 302B1 and 302C1 attendant console.

Circuit Packs:

- 8400x, 302B1 Terminals
  - TN754 (4-wire, mu-law)

    NOTE:
    Minimum usable vintage for 8410D and 8434D terminals - V11

  - TN413 (4-wire, A-law)
  - TN754B (4-wire, A-law/mu-law selectable)
  - TN2177 (2-wire, 16-port, A-law/mu-law selectable)

  - TN2181 (2-wire, 16-port, A-law/mu-law selectable)
  - TN2224 (2-wire, 24-port, A-law/mu-law selectable)
- 603A1/D1 Terminals
  - TN754 (4-wire, mu-law),
  - TN413 (4-wire, A-law)
  - TN754B (4-wire, A-law/mu-law selectable)

S8300 / G700

The MM712 Media Module supports 8410D and 8434D terminals (2-wire, 8-port, A-law/mu-law selectable).

Programmable Terminals

The following parameters are downloaded to programmable terminals.

Table 303: Parameters Downloadable to Programmable Terminals

Parameter	Scope	Terminal
International Flags (A-law/mu-law, Display Mode, DLI Voltage level)	System level	84xx, 603x, 302B1
Primary Levels (Transmission & Sidetone)	System level	84xx, 603x, 302B1
Adjunct Levels (Transmission & Sidetone)	System level	84xx
Handset Expander Option	System level	84xx
Administrable Options (Speakerphone & Mute Button)	Per-terminal	84xx
Administrable Softkeys	Per-terminal, System level	8410D, 8434D

Nonvolatile Memory

Nonvolatile memory stores downloadable parameters in programmable terminals. Once the terminal is downloaded, it is not be necessary to download it again, even if power is removed from the terminal. If nonvolatile memory fails with power still present, the terminal reverts to its default factory settings except for its A-law/mu-law companding settings which are stored in RAM. If power is removed after the nonvolatile memory fails, the terminal reverts to its factory default settings.

NOTE:
The mu-law companding mode is assigned as a default setting at the factory. For the United States, a programmable terminal can place calls even though it has not been downloaded from the system.

Download Actions

There are several different scenarios that cause a terminal to be downloaded. These can occur as part of background maintenance activity or on demand from the system access terminal or from a station.

For the following background actions, the terminal downloads automatically if a download retry flag for the terminal is set in software. This flag is set:

- At boot time when translation is loaded
- When translation that affects the parameters of a terminal is changed as part of system administration action
- When a port is inserted in software as a result of board insertion or translation change

Automatic Download Actions

This section describes download actions that occur automatically.

System Reboot/Restart

A global download action is started when periodic maintenance tests start after a system reboot/restart regardless of whether the parameters have been downloaded previously.

Periodic Tests

If the download flag is still set when periodic tests are run on a terminal, a download action will occur. This operation is required in case a terminal could not be downloaded previously either:

- Because it was off-hook at the time the system first booted
- Because the terminal was off-hook at the time translation associated with downloadable parameters was changed

NOTE:
It may take more than 1 hour for periodic tests to reach the terminal that needs to be downloaded.

Terminal Administration

A downloadable terminal is automatically downloaded when translation changes associated with downloadable parameters are made as part of system administration. As shown in Table 303, Parameters Downloadable to Programmable Terminals, on page 720, these changes can be for a specified terminal or may be system-wide. If the change is for system-level parameter, a background global update request is made to download all programmable terminals.

This global update may take more than an hour for a system with several thousand programmable terminals.

Port Insertion

Whenever maintenance software initiates a request to place a port into service, a terminal download action is started on that terminal if that terminal is programmable. This port insertion action occurs under the following circumstances:

- A digital line circuit pack or media module that is physically inserted into the system has ports currently administered for programmable terminals.

If more than 20 port insertion requests are received within a few seconds, a global download request is started up as a background task. This action updates all programmable terminals instead of just those being inserted. This is done to avoid system overload for situations where there is massive board insertion. This could occur when connectivity to an PN is re-established after that PN was down.

- A station port is added to the system by **add station** or **change station**.
- A TTI port is activated.

Audits

As part of periodic maintenance, the hardware status audit test queries programmable terminals to determine what levels and/or options are being used. If the reported values are not equal to the administered values, the system will initiate a terminal download action. This audit does NOT check the parameters used for softkeys.

Activation of TTI

A terminal is downloaded automatically when it is activated using the Terminal Translation Initialization feature. Therefore, no special user actions are required for TTI.

NOTE:
Plugging the station cord into a terminal does not automatically cause the terminal to be downloaded. If this terminal has factory defaults or if the terminal has been previously downloaded with parameters different from those desired, use one of the following demand download actions to download the terminal.

Demand Download Actions

Busyout/Release Command

A maintenance demand busyout/release request for a station will cause the terminal to be downloaded regardless of its previous download status.

Feature Access Code

A Refresh Terminal Parameters Feature Access Code can be used to request a terminal download action. When this code is followed by a pound sign (#), the programmable parameters for the current terminal are downloaded when the terminal goes on hook. When this code is followed by an extension, the programmable parameters for the specified station are downloaded.

This Refresh Terminal Parameters Feature Access Code is assigned on the second page of the **Feature Access Codes** form.

A confirmation is returned if the download request is accepted. A busy tone is returned if the request is made from a different station when the target station is off-hook.

NOTE:
For systems supporting circuit packs, the first three green call appearance LEDs on the 84xx 603x terminal will be turned on for three seconds if the station was successfully downloaded as a result of an entry of a Refresh Terminal Parameters Facility Access Code. This is not true for the 302B1 terminal.

There is no visible display on a station for the other background or demand download actions. However, as follows, the **Status Station** and **Status Attendant** forms can be used to check the download status of a specified terminal.

Status of Parameter Downloads

The **Status Station** and **Status Attendant** forms display the current download status of individual 84xx terminals (**S8300** / **G700**: MM712 Media Module), and 84xx, 603, and 301B1 terminals (**S8700** / **S8500** / **S8100**) in the `Download Status` field. The possible download states are:

Status	Explanation
Complete	Terminal successfully downloaded sometime in the past.
Pending	System waiting to download the terminal. This may require the execution of a background periodic test which could take more than an hour. A demand download as previously described may also be used to initiate an immediate download.
Not Applicable	Not a programmable terminal.

Possible reasons for a terminal not being downloaded include:

- Terminal is off-hook.
- Terminal detected a bad checksum.
- Terminal detected a bad or missing EEPROM (refer to hardware error log).
- Terminal is busy programming data from a previous PROGRAM message.
- Terminal is in the Programming Disabled state.
- Terminal is in the Local Program Options mode.
- Terminal is disconnected or out of service (use **status station** command).

Error Log Entries and Test to Clear Values

Table 304: Digital Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port <*address*> sh r 1**
1 *	40987, 1 – 20	None	WARNING	OFF	
18 *	0	**busyout port <*address*>**	WARNING	OFF	**release port <*address*>**
130 *		None	WARNING	ON	**test port <*address*> sh**
257 *	40971	None			
513	0	Station (Digital) Audits test (#17)	WARNING	OFF	**test port <*address*> sh r 6**
767 *	40964	None	WARNING	OFF	
769 *	40963 40988	None	WARNING	OFF	
1026 *		NONE	WARNING	OFF	
1281	Any	Station (Digital) Audits test (#17)	WARNING	OFF	**test port <*address*> sh r 4**
1537 *	40968	None	WARNING	OFF	
1793		Voice and Ctrl. Local Loop test (#13)	MINOR/ WARNING[2]	ON	**test port <*address*> l r 3**

1 of 2

Table 304: Digital Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2049		NPE Crosstalk test (#9)	MINOR/ WARNING[2]	ON	**test port <*address*> l r 3**
2304 *		None			
2305 *	32770, 40969	None			
2817 *	Any	None		OFF	
3585 *					
3840 *	40965, 40989	None			
3841 *	41029	None			

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to the test's description and follow the recommended procedures.

2 Major alarms may be downgraded to Warning alarms based on the value used in the set options command.

Error Additional Information:

Error Type 1; Aux Data - 40987: This Error Type with Aux Data 40987 could indicate a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

Error Type 1; Aux Data - 1 to 20: This Error Type and Aux Data 1 to 20 will occur when at least 15 off-board problems have been detected with the link to the terminal. When an error with the link is detected, an on-board counter is incremented.

The user could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

Error Type 18: This error type is logged when the port in question is busied out by maintenance personnel. Make sure port is released from busyout via the **release port** <***address***> command.

Error Type 130: This error type indicates that the circuit pack or media module has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 257: Problems transmitting to the voice terminal. This problem can be caused by defective wiring. Defective wiring can cause varying degrees of problems on different types of sets. Sets such as the 7410 appear to be more susceptible to wiring problems than other sets. This is usually an on-board problem and can be ignored if no user complaints are received.

Error Type 767: This is an in-line event that produces this error type when a favorable response is received from running the Digital Line Electronic Power Feed test (#11). No *craft* action is necessary. This alarm will be resolved with the passing of time.

Error Type 769: With Aux Data 40963, this error type is a result of an unfavorable response to the Electronic Power Feed/ Positive Temperature Coefficient test (#11). With Aux Data 40988, this error type indicates that the EPF/PTC circuit has been turned off due to an overcurrent condition.

S8700 / **S8500** / **S8100**

For TN754 vintage 13 or earlier and TN413, the EPF circuit senses an overcurrent condition at the voice terminal. Check for a short in the wiring, a damaged jack, an incorrect type of voice terminal, or a defective voice terminal.

For TN754 vintage 14 or later, TN754B and TN2136, the PTC will open if there is a short on the power line for 1/2 second or longer. The voice terminal is probably not operating properly. Unplug the voice terminal for 30 seconds and then plug it back in. If the voice terminal still does not operate, then check for a short in the wiring, a damaged jack, an incorrect type of voice terminal, or a defective voice terminal.

Once the problem has been resolved, it may take up to 1 hour for the alarm to clear due to "leaky bucket" strategy. If the problem cannot be resolved by one of the previous steps, then replace the circuit pack or media module.

Error Type 1026: There is a problem with the voice terminal EEPROM. When the voice terminal is repaired the alarm will be resolved with the passing of time.

Error Type 1537: An in-line maintenance error has generated an off-board warning due to some problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack or media module. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

Error Type 2304: Internal system error. No action is necessary.

Error Type 2305; Aux Data - 32770: This indicates that the station went off-hook while it was in the ready-for-service state. Use the **status station** command to determine the state of the station. The off-hook should have moved the station to ready-for-service. No *craft* action is necessary.

Error Type 2305; Aux Data - 40967: An in-line maintenance error has generated an off-board warning due to some problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack or media module. Once the problem has been resolved, the alarm will be retired after a predetermined amount of time.

Error Type 2817: Port Level Hyperactivity. Fifty or more CCMS uplink messages were received from the port within ten seconds. The user is taken out of service for a short interval of time (default 30 seconds).

Error Type 3585: This error type indicates that an attempt to execute a firmware download of a DCP terminal has failed. The DCP terminal must be replaced before the firmware download can be executed successfully. Replace the DCP terminal and re-execute the firmware download.

Error Type 3840; Aux Data - 40965: No terminal is connected to the Digital Line board. No maintenance action is required.

Error Type 3840; Aux Data - 40989: An uplink message has been logged indicating that the Electric Power Feed (EPF) is on with no load on it. No action is necessary.

Error Type 3841: The circuit pack's or media module's message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack or media module. No action is necessary.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. By clearing error codes associated with the Voice and Control Channel Local Loop-Around test, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Terminal Remote Loop-around Test (#1201) **S8300 / G700:** This test aborts with Error Code 1412.		X	D
Voice and Control Channel Local Loop-Around Test (#13) **S8300 / G700:** This test aborts with Error Code 1412.		X	ND
Digital Line NPE Crosstalk Test (#9) **S8300 / G700:** This test aborts with Error Code 1412.		X	ND
Digital Line Electronic Power Feed Test (#11)		X	ND
DIG-LINE Station Lamp Updates Test (#16)	X	X	ND
Station (Digital) Audits Test (#17)	X	X	ND

1 D = Destructive; ND = Nondestructive

Digital Terminal Remote Loop-around Test (#1201)

NOTE:
On the G700/ G350, this test aborts with Error Code 1412.

This test checks the connection between the media server and the digital terminal and the ability of the terminal and the associated port to send and receive data. This test is based on procedure 622 to isolate digital terminal problems.

A request is presented to the terminal to go into loop-back mode. Data is sent to the terminal and when received back, checked for consistency. This test is run as a part of the test long procedure. It is not included in any error recovery strategy and generates no error log entries or alarms. To begin the test, Maintenance will ask Communication Manager to make the associated endpoint and port Maintenance Busy. This test succeeds if the endpoint is “idle”. If the reserve request fails then the test aborts. If the request succeeds then the media server sends a message to loop around both information channels for the digital terminal.

1. First the primary information (voice information channel 1 or l1) channel loop-back test is run. The test is performed by sending a digital count from the Tone-Clock circuit on the primary information channel time slot and receiving the same digital count with a general purpose tone detector.
2. If the primary information channel test is successful, the loop-around test for the secondary information (data, Information Channel 2 or I2) channel is then performed. This is the same test as the primary information channel’s loop around test and is performed only if a DTDM is administered. This is also the case for a linked DA.

Only one value (Pass, Fail, or Abort) is generated as a result of the two tests run. If any test fails aborts, the sequence is stopped. Upon completion of this test, the associated endpoint and port are moved back into the previous service state.

Table 305: Test #1201 Digital Terminal Remote Loop-around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use the **display port <*address*>** command to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** ***Enter display port <address>*** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before resetting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The installed circuit pack does not support this operation.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.

Table 305: Test #1201 Digital Terminal Remote Loop-around Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required to run this test are not available. **1** Make sure terminal is connected and repeat test. **2** If test fails replace terminal and repeat test. **3** Retry the command at 1-minute intervals up to 5 times.
14	FAIL	The primary channel is not operating properly. User impact may range from noticing nothing to not being able to use the port. **1** Check the results of "Voice and Control Channel Local Loop test (#13). **2** If that test fails, suspect the Digital Line circuit pack. If that test passes then replace the terminal. **3** If both tests fail, and component replacement does not change the results, then: **a** Run circuit pack tests to check the tone generator circuit and the Tone Detector circuit using **test board <*address*>**. **b** Resolve any problems that are detected on the Tone Generator circuit or Tone Detector circuit.
1015	ABORT	The station is not busied out (**busyout station**).
16	FAIL	The secondary channel is not operating properly. User impact may range from noticing nothing to not being able to use this terminal. **1** Check the results of Voice and Control Channel Local Loop test (#13). **2** If that test fails, suspect the Digital Line circuit pack. If that test passes then replace the terminal. **3** If both test fail, and component replacement does not change the results, then: **a** Run circuit pack tests to check the tone generator circuit and the Tone Detector circuit pack using **test board <*address*>**. **b** Resolve any problems that are detected on the Tone Generator circuit or Tone Detector circuit.
	PASS	Voice and Control Channel Local Loop test passed. All channels are transmitting properly. **1** To verify that this is not an intermittent problem, repeat this test up to ten times. **2** If complaints persist (noisy connections for voice. corrupted data transfer for data), examine the station, connections, and wiring.

Digital Line NPE Crosstalk Test (#9)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's Long Test Sequence and takes about 20 to 30 seconds to complete.

S8100: Crosstalk testing is performed on both the primary information channel (voice) and the secondary information channel (data) associated with each digital station port. If this test fails on either channel, the station and the DTDM are taken out-of-service.

Table 306: Test #9 Digital Line NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1	ABORT	During testing of the primary information channel, system resources were not available. Also, the port may have been busy during the test. **1** Enter **display port <*address*>** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
2	ABORT	During testing of DTDM, system resources may not have been available. Also, the port may have been busy during the test. **1** Check if port is being used. If possible, disconnect by toggling disconnect button on DTDM. Retry command after 1 minute. **WARNING:** This action will drop the call in progress.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Enter **display port <*address*>** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 306: Test #9 Digital Line NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic. Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Enter **display port <*address*>** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out.
1020	ABORT	Test disabled by background testing. Use **status station** command to determine when station is available for testing.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The Network Processing Element (NPE) of the tested port was transmitting in error. Error code 1 = Crosstalk test failed on the primary channel. Error code 2 = Crosstalk test failed on the secondary channel. **1** Replace circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** To verify that this is not an intermittent problem, repeat this test up to 10 times. **2** If complaints persist, examine the station, connections, and wiring.

Digital Line Electronic Power Feed/Positive Temperature Coefficient/PPF Test (#11)

S8700 / S8500 / S8100

For TN413, and TN754 vintage 13 or earlier, this is an Electronic Power Feed (EPF) restoral test. In this test, the processor requests that the EPF be turned on for a given port, and an attempt is made to turn on the power supply to the station. If no current is drawn, the station is probably not connected. If an overcurrent condition is sensed, there may be a short in the loop. A message is returned reporting that either the EPF was successfully turned on, or that an overcurrent condition was sensed. This test is repeated again 5 seconds later.

For TN754 vintage 14 or later, TN754B and TN2136 this is a Positive Temperature Coefficient (PTC) restoral test. In this test, the processor requests that the PTC be turned on for a given port, and an attempt is made to turn on the power supply to the station. If an overcurrent condition is sensed, there is probably a short on the power line that causing the PTC to open and disconnect the voice terminal. Since the PTC does not have self-restoral capability, the voice terminal must be manually unplugged for 30 seconds and then plugged back in to restore the PTC. A message is returned reporting that either the PTC was successfully turned on successfully with no problem or an overcurrent condition was sensed. This test is repeated again 5 seconds later.

TN2181 and TN2224 boards carry a Protected Power Feed (PPF) relays, one for each port. Therefore this will be a Protected Power Feed restoral test. The test procedure and its response is same as that of EPF. One of differences between EFP and PPF is that, if the port goes into a overcurrent state, PPF does not report this change of state because it is a transient state which will not last more than 50ms. If the over current persists the power will be shut off automatically and an EPF_off_overcurrent message is sent uplink.

S8300 / G700

MM711 Media Modules provide power to the terminals. Therefore this will be an EPF restore test. The test procedure and its response is same as that of EPF. If the over current persists the power will be shut off automatically and an EPF_off_overcurrent message is sent uplink.

Table 307: Test #11 Digital Line Electronic Power Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Enter **display port <*address*>** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Electronic Power Feed test passed. The message to turn on the power to the station was successfully sent to the port. **1** Although, except for the previous **Internal system error**, this test never actually returns a FAIL result, it will log an error indicating the real results of the test. Check the Error Log for any entries with Error Types 767 or 769 after the test completes. **2** If Error Type 767 appears in the Error Log, this indicates that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station and check that every feature button is operating. **3** If Error Type 769 appears in the Error Log, this indicates some problem with the power to the station. Check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.

Voice and Control Channel Local Loop Test (#13)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

These tests check the information and control channels between the media server and the Digital Line port circuit. The media server sends a message to loop around both the port's information and control channels.

1 First, the primary information (voice) channel's loop-back test is run.

The test is performed by sending a digital count from the Tone-Clock circuit on the primary information channel's time slot and receiving the same digital count with a General-Purpose Tone Detector.

2 While the primary information channel is still looped around, the Control Channel Loop-Around test is run.

This test consists of sending four different transparent patterns to the on-board microprocessor, receiving them back, and comparing them.

3 Then, the secondary information (data) channel's loop-around test is run.

This is the same test as the primary information channel's loop-around test and is performed only if a DTDM is administered.

4 Next, a Conference test is run for the primary information channel.

This is the same test as Conference test (#6).

This 4-test sequence only generates one value (Pass, Fail, or Abort). If any test fails or aborts, the sequence stops.

Table 308: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.

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Table 308: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port <*address*>** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** Retry the command at 1-minute intervals up to 5 times.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Rerun the test at 1-minute intervals up to 5 times.
7	FAIL	Conference test failed on primary channel. In some cases, users may not notice disruption in service. In extreme cases, conferencing feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port.
15	FAIL	The control channel between the processor and digital circuit pack is not transmitting properly. User impact may range from noticing nothing to not being able to use the port. Could also be disruptive to other users.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port. **1** Run circuit pack tests to check the Tone Generator circuit and the Tone Detector circuit using **test board <*address*>**. **2** Resolve any problems that are detected on the Tone Generator circuit or Tone Detector circuit. **3** If the Tone Generator and Tone Detector circuit are functioning properly, and the test still fails, replace the Digital Line circuit pack.
	PASS	Voice and Control Channel Local Loop test passed. All channels are transmitting properly. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times. **2** If complaints persist (noisy connections for voice, corrupted data for data transfer), examine the station, connections, and wiring.

DIG-LINE Station Lamp Updates Test (#16)

This test lights all lamps on the terminal as specified. The lamp updates will run only if the station is in-service. The status of the station is checked and the lamp updates are blocked from taking place if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

Table 309: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1	ABORT	This port may have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via the **release station <*extension*>** command and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	Station may be in ready-for-service or out-of-service state. **1** Use **status station** command to verify state of station. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a "`t`" for the port). **2** If either **list config** or **display port** indicates that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.

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Table 309: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The message to light every station lamp was sent successfully to the port. **1** Observe the station lamps being lit when running the test. If all lamps do not light, the other Digital Line test results may indicate related problems that do not allow the lamps to light. **2** Investigate by using other Digital Line port tests, and by examining the station, wiring, and connections.

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Digital Station Audits Test (#17)

This is a series of six tests that are classified as audits. The media server sends messages to the on-board microprocessor to perform the following tests. These audits run only if the station is in-service.

- Switchhook Inquiry test — This is an update of the media server's records according to the circuit pack's or media module's records. This inquiry is sent all the way to the voice terminal.
- Bad Scan Inquiry test — An up-link message is sent containing a count generated by certain events relating to the link's conditions. This can be an indication of communications problems between the media server and Digital Port circuit pack or media module.
- ID Request test — A request is made to the station for its status. The station sends its configuration information and health information back. This information is checked and a pass/fail result is provided.
- Ringer Update test — This updates the digital telephone ringer state according to the processor records.
- DTMF Administration Update test — This is a message to the digital station to refresh the default value that causes the station to send touch- tones only in the primary information channel. This value is set initially when the station is put in-service and every time the station's state changes from other states to in-service state.

S8700 / S8500 / S8100

- EPF/PTC Inquiry test — For a TN413 or a TN754 (vintage 13 or earlier), an up-link status message of the Electronic Power Feed (EPF) is sent. Possible conditions are: EPF-on-ok, EPF-off, and EPF-no-load.

  For TN754 (vintage 14 or later), TN754B, TN2136, TN2181, or TN2224, an up-link status of the PTC is sent. Possible conditions are: PTC-on-ok, PTC-off, and PTC-no- load.

S8300 / G700

- For the MM712 Media Module, the status of the EPF is sent uplink. Possible conditions are: EPF-on-ok, EPF-off, and EPF-no-load.

Table 310: Test #17 Station (Digital) Audits Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Switchhook audit timed out.
2	ABORT	ID request fails, health bit returned from voice terminal is bad. **1** Make sure voice terminal is connected, and repeat the test. **2** If test fails, replace voice terminal and repeat test.
3	ABORT	**S8700** / **S8500** / **S8100**: The EPF/PTC has detected an overcurrent condition. **1** For a TN754 vintage 13 or earlier Digital Line circuit pack, use **test <*address*> long**. • If Test #11 passes, then the EPF/PTC condition was cleared. Rerun the Short Test Sequence. • If Test #11 does not pass, follow the repair procedures described for Test #11. **S8700** / **S8500** / **S8100** / **S8300**: **2** Look for Error Type 769 logged against DIG-LINE and follow the procedures in the additional information. If any additional problems are found, rerun the test.
4	ABORT	Internal system error **1** Resolve any outstanding circuit pack or media module maintenance problems. **2** Retry the command at 1-minute intervals up to 5 times.
5	ABORT	Ringer update aborted due to station being in ready-for-service or out-of-service state.
6	ABORT	This port may have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error is present, the release the port via **release station <*extension*>.** **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available.

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Table 310: Test #17 Station (Digital) Audits Test

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a "`t`" for the port). **2** If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test was not received in the allowable time period.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Station Audits passed. This Digital Port circuit pack or media module is functioning properly. **1** If complaints persist, investigate by using other port tests, and by examining the station, wiring, and connections.

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DIOD-BD (DIOD Trunk Circuit Pack)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DIOD-BD	MINOR	**test port *location* s**	DIOD circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

DIOD-DS1 (DS1 DIOD Trunk)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
DIOD-DS1	MAJOR[1]	**test trunk *group# member#* l**	DS1 DIOD Trunk
DIOD-DS1	MINOR	**test trunk *group# member#* l**	DS1 DIOD Trunk
DIOD-DS1	WARNING	**test trunk *group# member#***	DS1 DIOD Trunk

1 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed. For more information, see the **set options** command.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506* for information on how to administer trunks. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

A DS1 DIOD trunk provides a link for digitized voice or data communications between the system and a central office switch. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

NOTE:
32-channel mode is supported only on TN464 circuit packs and beginning with G3r V2 systems.

The DS1-DIOD MO monitors and maintains a DIOD trunk port on a TN464 UDS1 Interface circuit pack. See UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 for more information about this circuit pack. The DS1 circuit pack supports low-level CO trunk signaling interfaces for both ground-start and loop-start trunks. This maintenance strategy covers the in-line errors log, initialization tests, periodic tests, scheduled tests, demand tests, and alarm resolution and escalation.

Three trunk service states are specified by DS1 DIOD trunk maintenance:

out-of-service	The trunk is in a deactivated state and cannot be used for either incoming or outgoing calls.
in-service	The trunk is in an activated state and can be used for both incoming and outgoing calls.
disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

Error Log Entries and Test to Clear Values

Table 311: DS1 DIOD Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test trunk** *grp/mbr*
1(a)	57408				
1(a)	57487 57476 57477 57485				
15 (b)	Any	Port Audit and Update test (#36)			
18 (c)	0	**busyout trunk** *grp/mbr*	WARNING	OFF	**release trunk** *grp/mbr*
130 (d)		None	WARNING	ON	**test trunk** *grp/mbr*>
257 (e)	57392	DS1 CO Dial Tone Seizure test (#314)	MAJOR MINOR[2]	OFF	
513 (f)	57393	DS1 CO Dial Tone Seizure test (#314)	MAJOR MINOR[2]	OFF	
769 (g)	57484				
1025 (h)	51200				
1025		DS1 CO Dial Tone Seizure test (#314)	MINOR WARNING[3]	OFF	**test trunk** *grp/mbr* **r 2**
1281		Conference Circuit test (#7)	MINOR WARNING[3]	ON	**test trunk** *grp/mbr* **l r 4**
1537		NPE Crosstalk test (#6)	MINOR WARNING[3]	ON	**test trunk** *grp/mbr* **l r 3**
1793 (i)					**test board** *UUCSS* **l**
2049 (j)	57473 57474 57475				
2305 (k)	50944				
2562 (l)	16665				
2817 (m)	52992				
3840 (n)		Port Audit and Update test (#36)			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

2 This alarm is only raised when the System-Parameter Country screen has the `Base Tone Generator` field set to 4 (Italy). This alarm will be a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm will be upgraded to a MAJOR alarm.

3 Major alarms may be downgraded to Warning alarms based on the value used in the set options command.

Error Notes:

a **Error Type 1** — Aux Data 57408 — No tip ground is detected on an outgoing call.

Aux Data 57476 – Rotary Dial before Wink.
Aux Data 57477 – Rotary Dial pulse too early.
Aux Data 57485 – Wink too short for a valid signal.
Aux Data 57487 – PBX could not get "loop close" signal.

The DS1 Interface circuit pack detected a hardware fault. These errors will cause the Dial Tone test (#314) to run and are only considered a problem if the Dial Tone test fails (in which case Error Type 1025 will also show up). In this case, the trunk may be put in the ready-for-service state (shown as "disconnected" by the status command), which allows only incoming calls. Run the Dial Tone test (#314) and follow the procedures.

b **Error Type 15** — This is a software audit error that does not indicate any hardware malfunction. Run short test sequence, and investigate associated errors (if any).

c **Error Type 18** — System Technician has busied out the trunk to the out-of-service state. No calls can be made on this trunk except Facility Access Test Calls. For details, see Facility test calls in *Maintenance Procedures (555-245-103)*.

d **Error Type 130** — Indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

e **Error Type 257** — The DS1 Interface circuit pack detects a hardware fault. Aux Data 57392 indicates no external release on PBX disconnect.

f **Error Type 513** — The DS1 Interface circuit pack detects a hardware fault. Aux Data 57393 indicates belated external release on PBX disconnect.

g **Error Type 769** — The DS1 Interface circuit pack detects a hardware fault. Aux Data 57484indicates fault is detected on tip/ring.

h The DS1Interface circuit pack detects a hardware fault, and the `Aux Data` field contains the following error type: 51200, port is unavailable. Run the Dial Tone test (#314), and follow procedures.

i **Error Type 1793** — DS1 Interface circuit pack is out-of-service. Look for UDS1-BD errors in the Hardware Error Log if the port is on a TN464 UDS1 board. See UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 for details.

j **Error Type 2049** — With the following Aux Data:

Aux Data 57473 – Rotary dial rate below 8 pulses per second.
Aux Data 57474 – Rotary dial rate above 12 pulses per second.
Aux Data 57475 – Rotary Dial interdigit time is too short.

The DS1 interface circuit pack detects a hardware error on the DS1 DIOD trunk. The trunk cannot communicate with the far end because it is unable to interpret digits sent from the far-end switch. Check with the far-end switch or Operating Company for proper trunk connection.

k **Error Type 2305** — Recorder message, trunk could not be seized (Aux Data 50944). Run Test #314, and follow the outlined procedures.

l **Error Type 2562** — Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from Communication Manager and is generated when a second attempt (retry) to seize an outgoing trunk fails.

m **Error Type 2817** — Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and far ends. Attempt to place the call again. If the error persists, execute the Dial Tone Seizure test (#314), and follow those procedures.

n **Error Type 3840** — Port Audit and Update test (#36) failed due to an internal system error. Enter the **status trunk** command to verify the status of the trunk. If the trunk is out-of-service, then enter the **release trunk** command to put it back into in-service. Retry the test command.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the following table. By clearing error codes associated with the *NPE Crosstalk* test, for example, you may also clear errors generated from other tests in the testing sequence.

Table 312: System Technician-Demanded Tests: DS1-BD

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6)		X	ND
Conference Circuit test (#7)		X	ND
DS1 Dial Tone test (#314)	X	X	ND
Port Audit and Update test (#36)	X	X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 313: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. **1** Use **status station** or **status trunk** to determine when the port is available for testing. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 313: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Use **status health** to determine if the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Issue **list measurements tone-receiver** to see information about the system's tone receivers. **2** Resolve any TTR-LEV errors. **3** Resolve any TONE-PT errors. **4** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: • 1281 – Loss of signal • 1793 – Blue alarm • 2049 – Red alarm • 2305 – Yellow alarm • 1537 – Hyperactivity Look for the previous error types in the Hardware Error Log, and follow the procedures given in the DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) maintenance documentation for the listed error types.

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Table 313: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

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Conference Circuit Test (#7)

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

Table 314: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. **1** Use **status station** or **status trunk** to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. **1** Use **status station** or **status trunk** to determine when the port is available for testing. **2** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled by administration. This only applies to analog stations. **1** To enable test, use **change station *extension*** and set the `Test` field to **y**. Use the command.
1020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 314: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: • 1281 – Loss of signal • 1793 – Blue alarm • 2049 – Red alarm • 2305 – Yellow alarm • 1537 – Hyperactivity Look for the previous error types in the Hardware Error Log, and follow the procedures given in the DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) maintenance documentation for the listed error types.
	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated by using other port tests and by examining station, trunk, or external wiring.

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Port Audit and Update Test (#36)

This test sends port-level translation data from switch processor to the DS1 Interface circuit pack to assure that a trunk's translations are correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of trunk kept in the DS1 Interface circuit pack and in switch software.

Table 315: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.

1 of 2

Table 315: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	FAIL	Test failed due to internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent. If the trunk is busied out, the test will not run but will return PASS. To verify that the trunk is in-service: **1** Enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to step 2. **2** Enter **release trunk** to put the trunk back into in-service. **3** Retry the test command.

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DS1 CO Dial Tone Seizure Test (#314)

DS1 CO Dial Tone Seizure test checks the trunk's signaling capability provided by the DS1 Interface circuit pack. The maintenance software initiates the test by sending a "seizure" message to the DS1 Interface circuit pack and expects an "active" reply from the DS1 interface circuit pack. If the "active" message is received, then the test passes. If no message is received and the timer expires, the test is aborted. If the DS1 Interface circuit pack sends a "reorder" message back to maintenance software, then the test fails.

This test cannot be run on a trunk in any of the following conditions:

- The trunk direction is administered as an incoming only trunk.
- The trunk has been seized by a normal trunk call.
- The trunk is administered with maintenance test disabled.

Table 316: Test #314 DS1 CO Dial Tone Seizure Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status trunk** to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 316: Test #314 DS1 CO Dial Tone Seizure Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	Test failed due to incompatible configuration administered in trunk group screen. **1** Look at the ***Trunk Group*** administration screen and see if the trunk is incoming only, port 24 on a DS1 Interface with common control-channel signaling, or an automatic CO type such as FX. Under any of these conditions this is a normal abort.
1018	ABORT	Test has been disabled via administration. **1** Verify that the `Maintenance Tests` field on the ***Trunk Group*** screen is set to **n**. To enable the test, issue **change trunk-group *x*** where "***x***" equals the number of the trunk group to be tested, and change the `Maintenance Tests` field on the screen to **y**. **2** Repeat the test.
1020	ABORT	The DS1 Interface circuit pack is out-of-service. **1** Look for UDS1-BD errors in the Hardware Error Log. If present, see UDS1-BD (UDS1 Interface Circuit Pack) on page 1950. **2** Retry the command.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: • 1281 – Loss of signal • 1793 – Blue alarm • 2049 – Red alarm • 2305 – Yellow alarm • 1537 – Hyperactivity Look for the previous error types in the Hardware Error Log, and follow the procedures given in the DS1-BD (DS1 Interface Circuit Pack) or UDS1-BD (UDS1 Interface Circuit Pack) maintenance documentation for the listed error types.
	FAIL	The trunk cannot be seized for an outgoing call. **1** Verify that the `Trunk Type` field on the trunk administration screen screen matches the trunk type administered on far-end switch. **2** Look for UDS1-BD errors in Hardware Error Log. If present, see UDS1-BD (UDS1 Interface Circuit Pack) on page 1950. **3** Retry the test at 1-minute intervals up to 5 times.
	PASS	The trunk can be seized for an outgoing call.

DIOD-TRK (DIOD Trunk)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DIOD-TRK	MAJOR[2]	**test port *location***	DIOD Trunk
DIOD-TRK	MINOR	**test port *location***	DIOD Trunk
DIOD-TRK	WARNING	**test port *location***	DIOD Trunk

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command and that at least 75 percent of the trunks in this trunk group are alarmed.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506*, for information about how to administer trunks. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

Direct inward and outward dial (DIOD) trunks are 2-wire analog lines to the CO which support the following services:

- Both incoming and outgoing CO calls
- DID trunk
- DID trunk and 1-way outgoing DIOD

TN429 DIOD trunk circuit packs and MM711 Analog Media Modules provide eight ports for loop-start CO trunks and serve as an interface between the 2-wire analog CO line and the 4-wire TDM bus on the switch.

NOTE:
S8300 / **G700**: Although the DIOD-TRK MO is provided for a G700 Media Gateway, this MO only partially supports the MM711 Analog Media Module.

Loop Start Operation

Idle State: Tip = ground, Ring = CO Battery

Outgoing Call

1 PBX Off-Hook (Seize Message): Closes the Tip-Ring Loop CO Response: DC loop current + Dial tone

2 PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current CO Response: CO goes to idle state (see Note)

Incoming Call

1 CO Applies Ringing Voltage PBX Response: Detect ringing current

2 PBX Off-Hook (Answer Message): Close loop CO Response: Trip ringing, provide loop current

3 PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current CO Response: CO goes to idle state (see Note)

Direct Inward Dialing (DID)

1 CO Applies Ringing Voltage

PBX Response: Detect ringing current and close loop

CO Response: Send DTMF digits

PBX Response: Acknowledge of Number dialed and open loop

2 PBX Off-Hook (Answer Message): Close loop CO Response: Trip ringing, provide loop current

3 PBX On-Hook (Drop Message): Open Tip-Ring loop, no loop current CO Response: CO goes to idle state (see Note)

NOTE:
CO does not normally provide an On-Hook (Disconnect) signal.

Error Log Entries and Test to Clear Values

Table 317: DIOD Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port sh**
15 *	any	Port Audit Update test (#36)			
18	0	**busyout trunk *grp/mbr***	WARNING		**release trunk**
769 *	57392	None	MAJOR MINOR WARNING[2]	ON	
1537		Dial Tone test (#0)	MAJOR MINOR WARNING[2]	ON	**test port long r 2**
1793		Looparound and Conference test (#33)	MAJOR MINOR WARNING[2]	ON	**test port long r 3**
2049		NPE Cross Talk test (#6)	MAJOR MINOR WARNING[2]	ON	**test port long r 3**
2561 *	57345	None			
2817 *	57393	None			

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Table 317: DIOD Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3073 *	57376	None			
3585 *	57424	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

2 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the set options command. If the Minor alarm is not downgraded by the **set-options** values, the Minor alarm is upgraded to a Major alarm if 75 percent of the trunks in this trunk group are alarmed.

Error Additional Information:

Error Type 15: This is a software audit error and does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors.

Error Type 769; Aux Data - 57392: These are in-line errors that have no specific test associated with them. The CO is not releasing after the call is dropped from the PBX end. After several occurrences, an off-board warning alarm is generated. Refer the problem to the CO.

Error Type 2561; Aux Data - 57345: Single polarity ringing current — This is an in-line error that has no specific test associated with it. This error results from abnormal ringing current, but does not prevent the incoming call from being accepted. This error code is logged for information purposes only and does not cause additional testing to occur. One cause could be that the reverse current detector associated with the port is failing. (Will not be detected by any tests.) The other cause could be that normal current is not detected. In this case, neither incoming nor outgoing calls can be completed, and the Dial Tone test (#0) also fails. Check for other errors.

Error Type 2817; Aux Data - 57393: This is an in-line error that has no specific test associated with it. CO released the trunk at least four minutes after the PBX dropped the call. This error code is log only and causes no other testing to occur. No alarm is generated. Check for other errors.

Error Type 3073; Aux Data - 57376: This is an in-line error that has no specific test associated with it. No loop current on incoming call. The incoming destination has already answered and no loop current has been detected. If this is a hard fault, the Dial Tone test (#0) and every outgoing call should also fail. Check for other errors.

Error Type 3585; Aux Data - 57424: This is an in-line error that has no specific test associated with it. No loop current on outgoing call. This error occurs on an attempt to seize a loop or ground-start trunk for an outgoing call. An error occurs if loop current is not detected or the caller hangs up before it is detected. Busyout the affected port, and run a Long test. If the Dial Tone test (#0) passes, ignore this error. Release the port.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in the following table. By clearing error codes associated with the *NPE Crosstalk* test, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Dial Tone test (#0) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Looparound and Conference test (#33) **S8300** / **G700**: This test aborts with Error Code 1412.		X	ND
Audit Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

Dial Tone Test (#0)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

This test attempts to seize a port and checks for the return of a dial tone.

Table 318: Test #0 Dial Tone Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port <address>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.

Table 318: Test #0 Dial Tone Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port has been seized by a user for a valid call. Use **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test has been disabled via administration. **1** The `Maintenance Tests` field must be **y** on the ***Trunk Group*** form for this test to run. Use **change trunk-group** <***grp#***> to access the form. Then change the entry in the `Maintenance Tests?` field on the form to **y**.
1005	ABORT	Trunk has been administered as incoming-only; or DID trunk group type; dial tone can only be obtained on outgoing trunks. This is a normal condition.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Trunk was seized, but dial tone could not be detected. **1** Check for errors on TONE-BD or TONE-PT. Clear any errors and repeat test. **2** If error has still not cleared, refer problem to CO.
2002	FAIL	Seizure portion of test failed due to hardware problem. Fault is usually caused by a disconnected trunk. **1** Check trunk wiring to ensure good connection; repeat test if wiring correction made. **2** Locate another identical CO trunk and swap its wiring with one under test. Repeat test on both trunks and determine whether problem follows trunk or remains at original port. If problem follows trunk, refer problem to CO. If problem remains at port, replace the circuit pack and repeat test.
1009	PASS	Detected tone was not pure dial tone. No action required.
	PASS	Trunk was seized, and dial tone was detected. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

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NPE Crosstalk Test (#6)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and executes in about 20 to 30 seconds.

Table 319: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Enter **display port <address>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Enter **display port <address>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until it is idle before retesting.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

Looparound and Conference Circuit Test (#33)

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412.

This test checks the reflective loop and conference abilities of a CO port circuit. The test uses 404-, 1004-, and 2804-Hz tones. Each tone is transmitted separately through the loop and checked.

Table 320: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test.
7	ABORT	Conference Circuit test aborted.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Enter **display port <address>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is unavailable, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
7	FAIL	**1** Check for errors on TONE-BD or TONE-PT. **2** If the Reflective Looparound test fails for every port on a circuit pack, a -5V power problem is indicated. **S8700** / **S8500** / **S8100**: If a TN736 or TN752 power unit circuit pack is present, check the circuit pack for a red LED. If the red LED is on, then replace the power unit circuit pack. If neither the TN736 nor the TN752 Power Unit circuit pack is present, then the OLS631DB AC power unit may be defective. The system may contain a TN736 or TN752 power unit circuit pack *or* an OLS631DB AC power unit, *but not both*. See the RMC-ENV MO (**S8700 IP**), or the CARR-POW MO (**S8700 MC**). **3** Rerun the test. **4** If the test fails again, replace the circuit pack.
	PASS	CO Trunk Looparound and Conference test is successful. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring.

Port Audit Update Test (#36)

This test sends updates of the CO port translation for every translated port on the circuit pack or media module. The update is non-disruptive and guards against possible corruption of translation data contained on the circuit pack or media module. No response message is expected from the circuit pack or media module once it receives translation updates. The port translation data includes: ground or loop start trunk, tone or rotary dialing trunk, rotary dialing inter-digit timing, network balance R/RC, and disconnect timing.

Table 321: Test #36 Port Audit Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run the test.
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	This test passed. Translation information was successfully updated on the circuit pack or media module. User-reported troubles on this port should be investigated by using other port tests and by examining trunk or external wiring. If the trunk is busied out, the test does not run, but returns PASS. To verify that the trunk is in-service: **1** Enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to step 2. **2** Enter **release trunk** to put trunk back into in-service. **3** Retry the test command.

DLY-MTCE (MO-DAILY)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
DLY-MTCE	MINOR	NONE	DLY-MTCE
DLY-MTCE	MAJOR	NONE	DLY-MTCE

The DLY-MTCE MO monitors daily translation saves. If a translation save times out or fails to run, an error is logged against this MO.

If Save Fails	Then System Raises
Three times in a row	MINOR Alarm
Seven times in a row	MAJOR Alarm

Daily Maintenance Interference

Every action used in Communication Manager SAT administration commands is listed in the following table. The table also indicates the command actions that, while active, interfere with daily maintenance. They are the **add**, **change**, **duplicate**, **remove**, and **set** commands. Customer administrators frequently use these commands while performing routine administration of the system.

Table 322: Communication Manager SAT Command Actions

Likely to Disrupt	Less Likely to Disrupt	
add	backup	ping
change	busyout	recycle
duplicate	clear	release
remove	display	reset
set	enable	restore
	format	resume
	get	save
	list	status
	mark	test
	monitor	upgrade
	netstat	

Other command actions can also interfere with daily maintenance when certain qualifiers are used in the commands, or under certain circumstances. For example, certain "test" commands, when used with the modifier "continuously", could potentially interfere with daily maintenance. However, such command

actions are not typically used by customer administrators doing routine administration, and are less likely to disrupt daily maintenance routines than are the **add**, **change**, **duplicate**, **remove**, and **set** command actions.

Incomplete Command Time-Out

A time-out feature exists on the Maintenance-Related System Parameters screen. Use **change system parameters maintenance** to access the screen. The time-out feature improves the operation of daily maintenance by allowing maintenance routines to run that might otherwise not run. It also helps to prevent the loss of translations that were not saved with a **save translation**, and were also not saved because daily maintenance was prevented from running prior to the system reset. Highlights of the feature include:

- Options for blank, 1, 2, 3, 4, 5, or 6 hours (the default is 2 hours)
- The blank option indicates that the feature is not active
- Only commands that block the running of daily maintenance (add, change, duplicate, remove, and set) are affected
- All logins will time-out if any of these commands are active for the prescribed time (except for the “blank” option)
- The feature applies to all logins, regardless of type (init, dadmin, craft, inads) or permissions granted to the specific login ID of an administration or maintenance user
- The corresponding “time-out” entry is appended to the list history log

The `Command Time-out` field can be viewed by customer administrators. A craft, init, dadmin, or inads login is required to change the option for the field. Maintenance-Related System Parameters (change system-parameters maintenance) shows the Maintenance-related System Parameters screen for Communication Manager. Command Time-out Entry on the LIST HISTORY screen shows an example of the LIST HISTORY screen with the “time-out” entry. The final line indicates that **change system-parameters maintenance** was being executed when the time-out period of 2 hours expired.

Figure 47: Maintenance-Related System Parameters (change system-parameters maintenance)

```
change system-parameters maintenance                          Page   1 of   3
                  MAINTENANCE-RELATED SYSTEM PARAMETERS

SCHEDULED MAINTENANCE
                     Start Time: 01 : 00
                      Stop Time: 06 : 00
              Save Translation: daily
       Command Time-out (hours): 2
   Control Channel Interchange: no
System Clocks/IPSI Interchange: no
```

Figure 48: Command Time-out Entry on the LIST HISTORY screen

```
list history

                          HISTORY

             Date of Loaded Translation: no translation loaded

Date     Time      Port      Login     Actn    Object      Qualifier

9/18     16:13     MGR1      init      logn
9/18     16:13     MGR1      init      logf                TIME-OUT
9/18     14:13     MGR1      init      cha system-param maintenance
```

DS1-BD (DS1 Interface Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DS1-BD	MAJOR	**test board *location* sh**	DS1 Interface circuit pack
DS1-BD	MINOR	**test board *location* l**	DS1 Interface circuit pack
DS1-BD	WARNING	**test board *location* sh**	DS1 Interface circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The DS1 Interface circuit pack provides an interface to an external DS1 facility and supports 24 DS0 channels carried on a 1.544-Mbps DS1 link. These DS0 channels can be administered as either trunks to other switches or lines to off-premises stations. The TN464C (or higher-suffixed) Universal DS1 Interface also supports a 32-channel interface on a 2.048-Mbps link. The functions and maintenance strategy for the TN464 circuit packs are covered under a separate MO, UDS1-BD (UDS1 Interface Circuit Pack) on page 1950.

DS1-BD maintenance logs in-line errors reported by the DS1 Interface circuit pack, runs tests for error diagnosis and recovery, and raises and clears alarms. The following table shows the capabilities of each DS1 circuit pack. The TN722 and TN722B are not supported on G3r V1 or later systems.

Circuit Pack Code	24-Channel	32-Channel	Tie Trunk Signaling	CO Trunk Signaling	DID Trunk Signaling	OPS Line Signaling
TN722/B	X		X			
TN767/B/C/D/E	X		X	X	X	X
TN464C/D/E/F	X	X	X	X	X	X (24-chl only)
TN2313	X	X	X	X	X	X

ISDN-PRI Trunk signaling (for example, Q.921, Q.931) requires a TN464D and is handled by system software. The TN464 is covered in UDS1-BD (UDS1 Interface Circuit Pack) on page 1950.

Each trunk and line have their own maintenance strategies. However, they all depend on the health of the DS1 Interface circuit pack. See the following sections for details: TIE-DS1 (DS1 Tie Trunk) on page 1864, CO-DS1 (DS1 CO Trunk) on page 623, DID-DS1 (Direct Inward Dial Trunk) on page 684, OPS-LINE (DS1 Off-Premises Station Line) on page 1361, ISDN-TRK (DS1 ISDN Trunk) on page 1141, and ISDN-PLK (ISDN-PRI Signaling Link Port) on page 1121. Signaling over the DS1 link must be synchronized between the transmitting and receiving ends to ensure error-free communication. See SYNC (Port-Network Synchronization) on page 1751 for details.

Combined with a TN767E circuit pack, Avaya's 120A1 Integrated CSU module becomes an enhanced CSU. The 120A1 CSU, combined with new switch software and the functionality provided by a TN767E's hardware and firmware, provides functionality equivalent to an external stand-alone Avaya

ESF T1 CSU. The 120A1 CSU connects to the TN767E circuit pack on the I/O connector panel behind the port carrier, and thus becomes an integrated part of the system. Throughout this document, the term 120A1 means a 120A1 (or later-suffixed) CSU.

The 120A1 CSU (**S8100**: and the TN767E) is for use in the United States of America with 1.544-Mbps DS1 service. For more information about the 120A1 CSU module see *DEFINITY® Communications System Generic 1, Generic 2 and Generic 3 V1 and 2 – Integrated Channel Service Unit (CSU) Module Installation and Operation, 555-230-193*.

A TN767E and a 120A1 integrated CSU support on-demand loop-back tests assisting fault detection between the:

- TN767E circuit pack and the integrated CSU
- Integrated CSU and an optional customer-premises loop-back jack
- Integrated CSU and a remote CSU.

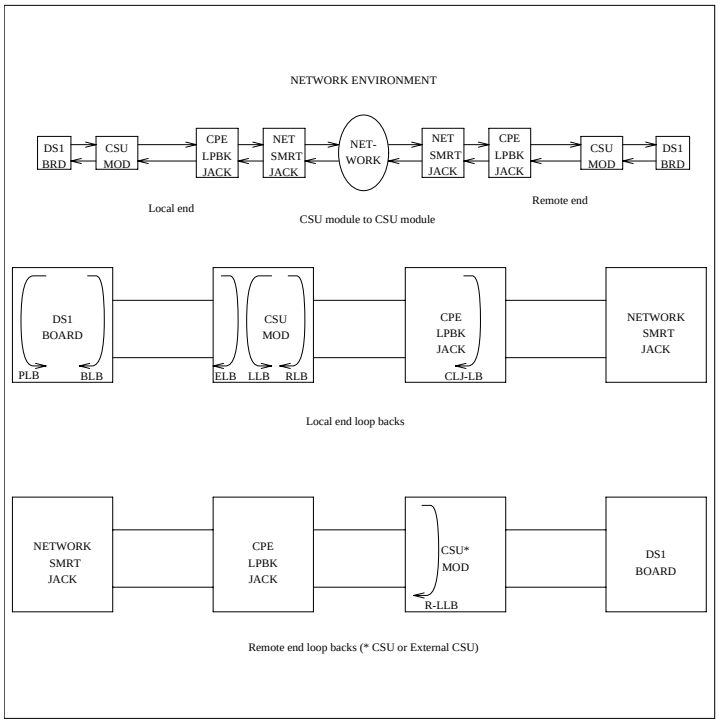
These loop-back tests are explained in detail later in this DS1-BD section, but Figure 49, High-Level Overview Of Loop-Back Points, on page 762 gives a high-level overview of the loop-back points.

The following list of acronym definitions are for Figure 49, High-Level Overview Of Loop-Back Points, on page 762:

- PLB = Payload Loopback
- BLB = Board Loopback
- ELB = Equipment Loopback
- LLB = Line Loopback
- RLB = Repeater Loopback
- CLJ = Loop-Back Jack Loopback
- R-LLB = Remote Line Loopback
- SMRT = Smart Jack
- LPBK = Loopback

For more information about DS1 interfaces, refer to the DEFINITY® Communications System Generic 2.2 and Generic 3 V2 DS1/CEPT1/ISDN-PRI Reference, 555-025-107.

Figure 49: High-Level Overview Of Loop-Back Points



Error Log Entries and Test to Clear Values

Table 323: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS*
1 (a)	0	Circuit pack removed or SAKI test (#53)	MINOR WARNING‡	ON	
18 (b)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board** *UUCSS*
23 (c)	0		WARNING	OFF	**add ds1** *UUCSS*
125 (d)		None	MINOR	ON	
257	65535	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **l r 20**
257 (e)	Any	None			
513 (f)	Any		MINOR	ON	
769 (g)	4358				
1025 (h)	4363	NPE Audit test (#50)			

Table 323: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1281	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR WARNING†	OFF	**test board** *UUCSS*
1300 (h)	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING	OFF	**test board** *UUCSS*
1301 (i)	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING	OFF	**test board** *UUCSS*
1302 (j)	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR WARNING†	OFF	**test board** *UUCSS*
1303 (k)	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR WARNING†	ON	**test board UUCSS**
1310 (l)	Any	Board Loopback test (#1209)	MINOR	ON	**test ds1-loop** *UUCSS* **ds1/csu-loopback-tests**
1311 (m)	Any	Equipment Loopback test (#1210)	MINOR WARNING†	OFF	**test ds1-loop** *UUCSS* **ds1/csu-loopback-test**
1312 (n)	Any	Repeater Loopback test (#1211)	MINOR WARNING†	OFF	**test ds1-loop** *UUCSS* **ds1/csu-loopback-tests**
1313 (o)	Any	CPE Loopback Jack test (#1212)	MINOR WARNING†	OFF	**test ds1-loop** *UUCSS* **end-loopback/span-test**
1314 (p)	Any	Far CSU Loopback test (#1213)	MINOR WARNING†	OFF	**test ds1-loop** *UUCSS* **end-loopback/span-test**
1320	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR WARNING†	OFF	**test board** *UUCSS*
1321	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR WARNING†	OFF	**test board** *UUCSS*
1322	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR	ON	**test board** *UUCSS*
1323	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR WARNING†	OFF	**test board** *UUCSS*
1324	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING	OFF	**test board** *UUCSS*
1538 (q)	Any		MINOR	ON	
1793	Any	Blue Alarm Inquiry test (#139)	MAJOR MINOR WARNING**	OFF	**test board** *UUCSS*
1794	Any	Blue Alarm Inquiry test (#139)	MAJOR MINOR WARNING**	OFF	**test board** *UUCSS*

Table 323: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1795	Any	Blue Alarm Inquiry test (#139)	MAJOR MINOR WARNING**	OFF	**test board** *UUCSS*
2049	Any	Red Alarm Inquiry test (#140)	MINOR WARNING†	OFF	**test board** *UUCSS*
2305	Any	Yellow Alarm Inquiry test (#141)	MINOR	OFF	**test board** *UUCSS*
2306	Any	Yellow Alarm Inquiry test (#141)	MINOR	OFF	**test board** UUCSS
2561	Any	Major Alarm Inquiry test (#142)	MINOR WARNING†	OFF	**test board** *UUCSS*
2817		Minor Alarm Inquiry test (#143)	MINOR WARNING†	OFF	**test board** *UUCSS*
3073 to 3160 (r)	Any	Slip Alarm Inquiry test (#144)	MINOR WARNING†	OFF	**test board** *UUCSS* **r 6**
3329 to 3345 (s)	Any	Misframe Alarm Inquiry test (#145)	MINOR WARNING†	OFF	**test board** *UUCSS* **r 6**
3840 (t)	Any	None			
3900 (u)	Any	CPE Loopback Jack test (#1212)			
3901(v)	Any	Far CSU Loopback test (#1213)			
3902 (w)	Any	One-Way Span test (#1214)			
3999 (x)	Any	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to the test's description and follow the recommended procedures.

Error Notes:

a This error indicates that the circuit pack has stopped functioning or is not completely administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be completely administered, a DS1 circuit pack must meet all 3 of the following conditions:

1 Have an entry in the circuit plan field in **change circuit-packs**

2 Be administered using **add ds1** ***UUCSS***

3 Be physically inserted in the correct slot

If the circuit pack has an entry in the circuit plan and either of the other two conditions are *not* met, a MINOR alarm is logged. To resolve the error, either:

1. Make sure all conditions for administration are met and that a functioning DS1 circuit pack is inserted in the correct slot.
2. Completely remove the DS1-BD from the system using the following steps:
   a. Remove any administered DS1 trunks or access endpoints associated with the circuit pack from their trunk groups.
   b. Execute **remove ds1 *UUCSS*** and **change circuit-packs *UU***.

If all the administration conditions are met for this circuit pack and the red LED is still on, follow the instructions in LED alarms without Alarm Log entry or with Error Type 1 on page 27.

b The DS1 Interface circuit pack has been busied out by a **busyout board** UUCSS command.

c The DS1-BD circuit pack is not completely administered. A completely administered DS1-BD circuit pack should have an entry in the circuit plan via **change circuit-packs**, should have been administered via **add ds1 *UUCSS***, and should have been inserted into the correct port slot.

d The circuit pack in the slot does not match the type administered to that position. Either replace the circuit pack with one of the type administered, or use **change circuit-packs** to re-administer the slot. This error may also indicate that the 24/32-channel selection on the DS1 administration screen does not match the configuration of the circuit pack.

e This error is associated with the Common Port circuit pack maintenance test. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for details.

f The DS1 Interface circuit pack has detected a transient hardware problem (for example, external RAM failure, internal RAM failure, internal ROM failure, or instruction set failure). This error will disappear when no faults are detected for 30 minutes. The value in the `Aux Data` field indicates the type of hardware problem. However, when this error is reported with Aux Data in the range of 4352 to 4358, it indicates the circuit pack has reported a hardware failure. This problem should be escalated.

g The DS1 Interface circuit pack has detected a transient hardware logic error (for example, program logic inconsistency). This error will disappear when no faults are detected for 100 minutes. The value in `Aux Data` field indicates the type of hardware problem.

h CSU module or T1 sync splitter missing. The `Near-End CSU Type` field on the **add ds1** screen has been administered as `integrated`, but the 120A1 CSU or T1 sync splitter is not physically connected (or is improperly connected) to the TN767E board behind the port carrier.

If using the 120A1 CSU or T1 sync splitter, plug (or replug) the CSU or T1 sync splitter into the TN767E circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, change the `Near-End CSU Type` field using the **change ds1** screen to `other`.

If this error remains after plugging the 120A1 CSU or T1 sync splitter into the board's connector, there could be a problem with the I/O connector panel.

i CSU module/T1 sync splitter not expected. The 120A1 CSU or T1 sync splitter is physically connected to the TN767E board behind the port carrier, but the `Near-End CSU Type` field on the **add ds1** screen has not been administered as `integrated`.

If the 120A1 CSU or T1 sync splitter is to be used, use the **change ds1** command to change the `Near-End CSU Type` field to `integrated`. Otherwise, physically remove the 120A1 CSU or T1 sync splitter from the back of the port carrier.

j DS1 configuration error. Attempting to use a 120A1 CSU with a TN767E circuit pack that is configured for 32-channel (2.048-Mbps) operation. This CSU only works with a DS1 board configured for 24-channel (1.544-Mbps) operation in the United States of America.

k DS1 circuit pack suffix incorrect for CSU or T1 sync splitter. The `Near-End CSU Type` field on the **add ds1** screen has been administered as `integrated` but the DS1 circuit pack is not a TN767E (or higher-suffixed) DS1 board.

If the 120A1 CSU or T1 sync splitter is to be used, remove the circuit pack and replace it with a TN767E (or higher-suffixed) board. Otherwise, use the **change ds1** command to change the `Near-End CSU Type` field to `other`.

l BLB failure. This error occurs when the DS1 Board Loopback (BLB) demand test fails. Repeat the test using the following commands: **busyout board *UUCSS***, **test ds1-loop *UUCSS* ds1/csu-loop-back jack-tests**, **release board *UUCSS***. If the BLB test continues to fail, then the TN767E circuit pack needs to be replaced.

m ELB failure. This error occurs when the Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test fails. This test is executed during I-CSU/T1 sync splitter power-up/reset (i.e., the TN767E board is physically inserted and the CSU module/T1 sync splitter is already installed) or when the CSU module/T1 sync splitter is plugged on to an already initialized DS1 board. The ELB test is also executed as part of the command **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.

Attempt to clear the alarm via the following commands: **busyout board *UUCSS***, **test ds1-loop *UUCSS* ds1/csu-loopback-tests**, and **release board *UUCSS***. If the ELB test continues to fail, then either the TN767E board, the CSU module, the T1 sync splitter, or the I/O cable between the backplane and the CSU module/T1 sync splitter (or any combination thereof) has failed. Escalate this problem.

n RLB failure. This error occurs when the Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test fails. This test is executed during I-CSU/T1 sync splitter power-up/reset (i.e., the TN767E board is physically inserted and the CSU module/T1 sync splitter is already installed) or when the CSU module/T1 sync splitter is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.

Attempt to clear the alarm via the following commands: **busyout board *UUCSS***, **test ds1-loop *UUCSS* ds1/csu-loopback-tests**, and **release board *UUCSS***. If the RLB test continues to fail, then the CSU module/T1 sync splitter needs to be replaced.

o CPE loop-back jack deactivation error. This error occurs when the TN767E circuit pack could not deactivate a CPE loop-back jack loop-back.

Attempt to clear the alarm via the following commands: **busyout board *UUCSS***, **test ds1-loop *UUCSS* end-loopback/span-test**, and **release board *UUCSS***. If the attempt to deactivate the CPE loop-back jack loop back continues to fail, other steps must be taken to deactivate the loop back.

p Far CSU Loopback deactivation error. This error occurs when the TN767E circuit pack could not deactivate a far-end CSU loop back on power-up/reset or upon software request.

Attempt to clear the alarm via the following commands: **busyout board *UUCSS***, **test ds1-loop *UUCSS* end-loop back/span-test**, **release board *UUCSS***. If the attempt to deactivate the Far CSU loop back continues to fail, then escalate the problem.

q The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

1 The common circuit pack-level tests such as Test #51 and/or Test #220 are aborting with error code 2000.

2 The tests run on the ports of this circuit pack are returning NO BOARD.

3 A busyout/release of the circuit pack has no affect on test results.

4 A **list configuration** command shows that the circuit pack and ports are properly installed.

The circuit pack is isolated from the system and all trunks of this circuit pack are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 Interface circuit pack is restored to normal operation. All trunks of the DS1 Interface circuit pack are then returned to the in-service state. If the error recurs after 15 minutes, then escalate this problem.

r For later releases of G3V4 and beyond, only error 3073 will show that this board is receiving Slips and the AUX data shows the last Slip count that was reported.

s For later releases of G3V4 and beyond, only error 3329 will show that this board is receiving misframes and the AUX data shows the last misframe count that was reported.

t This error is not service-affecting and can be ignored.

u Error 3900 is used to give status information about a CPE Loopback Jack test. The value in the `Aux Data` field indicates the status of the loop-back test.

1 — Test is currently running.

2 — Test failed because loop back could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been deactivated.

v Error 3901 is used to give status information about a Far CSU Loopback test. The value in the `Aux Data` field indicates the status of the loop-back test.

1 — Test is currently running.

2 — Test failed because loop back could not be activated.

3 — Test failed because test pattern could not be detected.

4 — Test has been deactivated.

w Error 3902 is used to give status information about a One-Way Span test. The value in the `Aux Data` field indicates the status of the span test.

1 — Test is currently running.

2 — Test has failed because test could not be activated.

3 — Test pattern was not received from the far end.

4 — Test has been deactivated.

x Error type 3999 indicates that the circuit pack sent a large number of control-channel messages to the switch within a short period of time. If Error Type #1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If Error Type #1538 is absent, then the circuit pack has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order they are presented in Table 324, System Technician-Demanded Tests: DS1-BD, on page 768. By clearing error codes associated with the *NPE Connection Audit* test, for example, you may also clear errors generated from other tests in the testing sequence

Table 324: System Technician-Demanded Tests: DS1-BD

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop Command	D/ND[1]
NPE Connection Audit test (#50)		X			ND
Control Channel Loop test (#52)		X			ND
Loss of Signal Alarm Inquiry test (#138)	X	X			ND
Blue Alarm Inquiry test (#139)	X	X			ND
Red Alarm Inquiry test (#140)	X	X			ND
Yellow Alarm Inquiry test (#141)	X	X			ND
Major Alarm Inquiry test (#142)	X	X			ND
Minor Alarm Inquiry test (#143)	X	X			ND
Slip Alarm Inquiry test (#144)	X	X			ND
Misframe Alarm Inquiry test (#145)	X	X			ND
Translation Update test (#146)	X	X			ND
ICSU Status LEDs test (#1227)	X	X			ND
SAKI Sanity test (#53)			X		D
Internal Looparound test (#135)			X		D
DS1/CSU Loopback tests				X	D
DS1 Board Loopback test (#1209)				X	D
CSU Equipment Loopback test (#1210)				X	D
CSU Repeater Loopback test (#1211)				X	D
CPE Loop-Back Jack test (#1212)				X	D
Far CSU Loopback test (#1213)				X	D
One-Way Span test (#1214)				X	D
Inject Single Bit Error (#1215)				X	D
End Loopback/Span test (#1216)				X	D

1 D = Destructive, ND = Non-destructive

NPE Connection Audit Test (#50):

The system sends a message to the on-board microprocessor to update the network connectivity translation for all the Network Processing Elements (NPEs) on the circuit pack.

Table 325: Test #50 NPE Connection Audit Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	System resources required for this test are not available.
1019	ABORT	Test already in progress.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The circuit pack's NPEs have been updated with their translation.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** Issue the **busyout board** command. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Control Channel Loop-around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 326: Test #52 Control Channel Loop-around Test

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

Table 326: Test #52 Control Channel Loop-around Test

Error Code	Test Result	Description / Recommendation
	FAIL	The test failed because the circuit pack did not return the circuit pack code or vintage. **Note:** Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as Tests 138 and 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test result. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem. **1** Retry the command up to 5 times. **2** If the problem continues, check for hyperactivity. Resolve the problem, as appropriate. **3** If there is no longer hyperactivity, retry the command up to 5 times. **4** If the test continues to fail, escalate this problem.
	PASS	Communication with this circuit pack is successful.

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Table 326: Test #52 Control Channel Loop-around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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SAKI Sanity Test (#53)

This test is **destructive**. This test **resets** the circuit pack.

Table 327: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Wrong circuit pack configuration to run this test. This error applies only to DS1 Interface circuit packs. It means the DS1 Interface circuit pack is providing timing for the system and, therefore, it cannot be reset without major system disruptions. **1** If the circuit pack needs to be reset, then set synchronization to another DS1 Interface circuit pack or to the Tone-Clock circuit and try again. Refer to "SYNC (Synchronization)".
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack. **2** Execute the command again.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The circuit pack failed to reset.

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Table 327: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The circuit pack failed to restart. **1** Execute the command again. **2** If the problem persists, escalate this problem.
	PASS	The circuit pack initializes correctly. **1** Run the short test sequence.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Internal Loop-Around Test (#135)

This test is **destructive**.

The Internal Looparound test is run by looping the transmitted DS1 bit stream back into the DS1's board receiver. The loop occurs just before the DS1 facility interface. The test is highly destructive and can only be initiated by a technician-demanded **reset board *UUCSS*** command.

All trunks on the DS1 Interface circuit pack must be busied out via the system technician **busyout board** command before running the Internal Looparound test. When the Internal Looparound test is initiated, maintenance software sends messages to the DS1 Interface circuit pack to start the test. The test uses the Tone Generator and Tone Detector to exercise a bit pattern consistency test for all ports. If the transmitted and received bit patterns on a trunk are different, the test fails.

When the test is complete, the maintenance software sends a stop loop around message to the DS1 Interface circuit pack to put the circuit pack back into the normal operation mode. All trunks of the DS1 Interface circuit pack are restored to the in-service state after the **release board** command is entered.

Table 328: Test #135 Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	Received an incoming call on a port of the DS1 circuit pack during the test. **1** Enter **busyout board *UUCSS*** to put every trunk on the DS1 circuit pack into the out-of-service state. **2** Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	Ports on DS1 Interface circuit pack have not been busied out. **1** Enter **busyout board *UUCSS*** to put every trunk on the DS1circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Therefore, it cannot be reset without major system disruption. **1** If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit using the following command sequence: **a** Issue the **disable synchronization-switch** command. **b** Issue the **set synchronization *UUCSS*** command. **c** Issue the **enable synchronization-switch** command.

Table 328: Test #135 Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	The test was aborted. Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as Tests 139 and 140) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error recurs after 15 minutes, escalate this problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	DS1 Interface circuit pack failed the Internal Looparound test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the DS1 Interface circuit pack is a TN767, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. Otherwise, skip this step. **3** Verify that both of the DS1 link's endpoints are assigned with the same signaling mode, framing mode, and line coding. **4** Check the physical connectivity of DS1 Interface circuit packs and cable. **5** Contact T1 Network Service to diagnose remote DS1 endpoint. **6** If 2 to 5 are OK and the problem recurs, escalate the problem.

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Table 328: Test #135 Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
	PASS	Every administered trunk of DS1 Interface circuit pack passed the Internal Looparound test. The bit pattern consistency test executed successfully over the path that covers a DS1 port, cable, and the external NCTE device.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Loss of Signal Alarm Inquiry Test (#138)

This test verifies the synchronization status and continuity of the DS1 link. The Loss of Signal alarm indicates that the DS1 Interface circuit pack is unable to derive the synchronization clock from the DS1 facility. When the DS1 Interface circuit pack detects a Loss of Signal alarm, it stops providing the synchronization clock for the system if it is administered as a timing source and transmits a Yellow alarm to the remote DS1 endpoint.

When the Loss of Signal alarm is confirmed, the maintenance software places all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. The inquiry test will run every 10 minutes until the loss of signal has been restored. The DS1 Interface circuit pack raises a Loss of Signal alarm after the signal has been lost for about 1second. It will not retire the alarm until the signal has returned for about 10 seconds.

S8700 MC

This test is also used to maintain the 120A CSU module and the 401A T1 sync splitter. The CSU module, when combined with the functionality provided by the TN767E circuit pack, provides functionality equivalent to an external standalone ESF T1 CSU The 401A T1 sync splitter, when combined with the functionality provided by the TN767E circuit pack, allows an ATM switch to derive its timing off a T1 facility connected to the S8700 Multi-Connect's DS1circuit pack.

If a TN767E circuit pack detects certain I-CSU/T1 sync splitter hardware errors, it will notify the maintenance subsystem. When the subsystem receives notification of the error, it executes this Loss of Signal Inquiry test. The test, in addition to querying for a Loss of Signal alarm condition, will also query the TN767E board to confirm the error. A Minor or Warning alarm will be raised depending on the severity of the error. The trunks on the board may be taken out of service if the error is deemed serious.

If a Loss of Signal alarm and an I-CSU/T1 sync splitter error co-exist, the Loss of Signal alarm condition takes priority, and the board and all of its trunks are put in the out-of-service state. However both errors will be logged.

When the maintenance subsystem receives notification that the ICSU/T1 sync splitter hardware error condition no longer exists, maintenance will restore the board and all trunks to their previous service state if the alarm can be cleared (no other errors or Loss of Signal alarm exist).

Table 329: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.

Table 329: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	DS1 Interface circuit pack detects a Loss of Signal alarm. The physical link is broken or the remote DS1 endpoint is down. All trunks or ports of this DS1 interface circuit pack are out-of-service. If the DS1 Interface circuit pack is designated as the supplier of the system synchronization source, then the system synchronization maintenance will adopt a source elsewhere. Refer to "SYNC (Synchronization)" section for details. **1** If the DS1 Interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 Interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **2** Check the physical connection of the DS1 Interface circuit pack and the cable. If a 120A1 CSU module/T1 sync splitter is physically connected to a TN767E board behind the port carrier, check the physical connection of the CSU module/T1 sync splitter, and make sure the Network Interface cable is plugged into the CSU module's/T1 sync splitter's NETWORK jack.
1300	FAIL	The CSU module or the T1 sync splitter is missing. The `Near-End CSU Type` field on the **add ds1** screen has been administered as *integrated*, but the 120A1 CSU module/T1 sync splitter is not physically connected to the TN767E board behind the port carrier. **1** If using the 120A1 CSU module/T1 sync splitter, plug the CSU module/T1 sync splitter into the TN767E circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the `Near-End CSU Type` field using the **change ds1** screen to **other**. **2** Run the test again.
1301	FAIL	The 120A1 CSU module or the T1 sync splitter is physically connected to the TN767E board behind the port carrier, but the `Near-End CSU Type` field on the **add ds1** screen has not been administered as *integrated*. **1** If the 120A1 CSU module/T1 sync splitter is to be used, use **change ds1** to change the `Near-End CSU Type` field to *integrated*. Otherwise, physically remove the 120A1 CSU module/T1 sync splitter from the back of the port carrier. **2** Run the test again.
1302	FAIL	Attempting to use a 120A1 CSU module with a TN767E circuit pack that is configured for 32-channel (2.048-Mbps) operation. This CSU only works with a DS1 board configured for 24-channel (1.544-Mbps) operation in the United States of America. **1** If the 120A1 CSU is to be used, physically remove the TN767E circuit pack, and reconfigure it for 24-channel (1.544-Mbps) operation. **2** Reinsert the circuit pack, and run the test again.

Table 329: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1303	FAIL	The DS1 circuit pack's suffix is incorrect for CSU module/T1 sync splitter administration. The `Near-End CSU Type` field on the **add ds1** screen has been administered as *integrated*, but the DS1 circuit pack is not a TN767E (or higher-suffixed) DS1 board. **1** If the CSU module or the T1 sync splitter is to be used, and the `Near-End CSU Type` field is set to *integrated* to allow for CSU module/T1 sync splitter administration, remove the circuit pack and replace it with a TN767E (or higher-suffixed) board. Otherwise, use **change ds1** to set the `Near-End CSU Type` field to **other**.
1310	FAIL	The DS1 Board Loopback (BLB) demand test (#1209) failed. **1** Repeat the test using **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the BLB test continues to fail, then replace the TN767E circuit pack. **3** Run this test again.
1311	FAIL	The Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test (#1210) failed. This test is executedduring ICSU/T1 sync splitter power-up/reset (the TN767E board is physically inserted and the CSU module/T1 sync splitter is already installed) or when the 120A CSU module/T1 sync splitter is plugged on to an already initialized DS1 board. The ELB test is also executed as part of the command **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **1** Execute **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. If the ELB test continues to fail, then either the TN767E board, the CSU module/T1 sync splitter, or the I/O cable between the backplane and the CSU module/T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. **2** Replace the CSU module/T1 sync splitter and run **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **3** If the ELB test continues to fail, then replace the TN767E board and run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** again. **4** If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module/T1 sync splitter.
1312	FAIL	The Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test (#1211) failed. This test is executed during ICSU/T1 sync splitter power-up/reset (the TN767E board is physically inserted and the CSU module/T1 sync splitter is already installed), or when the 120A1 CSU module/T1 sync splitter is plugged on to an already initialized DS1 board. The RLB test is also executed as part of the command **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **1** Execute **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the RLB test continues to fail, replace the CSU module/T1 sync splitter. **3** Run this test again.

Table 329: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1313	FAIL	The TN767E circuit pack could not deactivate a CPE loop-back jack loop back. **1** Execute **test ds1-loop *UUCSS* end-loopback/span-test**. **2** If the attempt to deactivate the CPE loop-back jack is not successful, check the cabling and investigate the problem at the CPE loop-back jack. **3** Run the test again.
1314	FAIL	The TN767E circuit pack could not deactivate a far-end CSU loop loop-back. **1** Execute **test ds1-loop *UUCSS* end-loopback/span-test**.
1320	FAIL	A CSU module/T1 sync splitter hardware failure or an ICSU/T1 sync splitter serial interface audit failure was detected by the TN767E DS1 circuit pack. **1** Replace the CSU module/T1 sync splitter, and then run the test again. **2** If the test continues to fail with this error code, replace the TN767E and run the test again. **3** If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module/T1 sync splitter.
1321	FAIL	DTE LOS (loss of signal) was detected between the TN767E DS1 board and the 120A1 CSU module or the T1 sync splitter. Either the TN767E board, the 120A1 CSU module/T1 sync splitter, or the I/O cable between the backplane and the 120A1 CSU module or the 401A T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. **1** Replace the CSU module/T1 sync splitter, and run the test again. **2** If the test continues to fail with this error code, then replace the TN767E board, and run the test again. **3** If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the 120A1 CSU module or the 401A T1 sync splitter.
1322	FAIL	No 5-Volt power detected from the TN767E circuit pack to the 120A1 CSU module/T1 sync splitter. Problem is probably due to an open fuse on the DS1 board or a faulty ICSU/T1 sync splitter. **NOTE** *Do not swap DS1 boards as this may open the fuse on the new board.* **1** Remove the TN767E from the system and reinsert. **2** Run the test again once the board has finished its reset. **3** If the test continues to fail with this error code, then replace the CSU module/T1 sync splitter, and run the test again. **4** If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the 120A1 CSU module or the 401A T1 sync splitter. **5** If the test continues to fail with this error code, escalate this problem.

Table 329: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1323	FAIL	A service-affecting CSU module/T1 sync splitter audit failure was detected by the TN767E DS1 circuit pack. All administered ports on the DS1 circuit pack are affected and maintenance software will place the ports into the out-of-service state. **1** Replace the 120A1 CSU module/T1 sync splitter.
1324	FAIL	A non-service-affecting CSU module/T1 sync splitter audit failure was detected by the TN767E DS1 circuit pack. No ports should be affected. No immediate action is required. These errors indicate that the CSU module/T1 sync splitter hardware may have a problem, and that it should be replaced when practical to avoid further deterioration.
	PASS	DS1 signal is present and the physical link is healthy. In addition, no Integrated CSU errors are detected.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use the **add ds1 *UUCSS*** command to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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Blue Alarm Inquiry Test (#139)

A remote DS1 endpoint sends a blue-alarm signal across the DS1 link when it is out-of-service. When a local DS1 Interface circuit pack detects a blue alarm from the remote DS1 endpoint, the circuit pack sends both:

- Periodic yellow alarms to the remote DS1 endpoint
- A BLUE ALARM message to the maintenance software

The Blue Alarm Inquiry test checks the remote DS1 endpoint's blue-alarm status. After the blue alarm is confirmed, maintenance software

- Takes every DS1 trunk on the circuit pack out of service
- Runs this test every 10 minutes until the blue alarm is cleared

For blue alarms, a DS1 Interface circuit pack takes much longer to recognize and report its ***resolution*** (~ **16** seconds) than its ***occurrence*** (~ **2** seconds). So, when a blue alarm is cleared, the local DS1 Interface circuit pack avoids false blue alarms by quickly:

- Restoring the DS1 trunks to service
- Discontinuing yellow alarms to the remote endpoint

before the remote endpoint can recognize and report another blue alarm.

Line Loopback Alarm

The Line Loopback (LLB) is used by the remote DS1 endpoint to put the ICSU or DS1 into a loop-back mode. When the ICSU or DS1 Board is in the LLB mode, the arriving bit pattern is regenerated and sent back. Line Loopback (LLB) Alarm is activated when the in-band activate LLB bit pattern has been arriving continuously for 5 seconds on the DS1 line. LLB is deactivated when the in-band deactivate LLB bit pattern has been arriving continuously for 5 seconds on the DS1 line.

Since LLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Payload Loopback Alarm

The Payload Loopback (PLB) is used by the remote DS1 endpoint to put the switch DS1 into a loop-back mode. PLB Alarm is activated when a network protocol activate bit pattern arrives over the 4-kbps ESF data link on the DS1 line. PLB is deactivated when a network protocol deactivate bit pattern arrives over the 4-kbps ESF data link on the DS1 line.

Since PLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Table 330: Test #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 330: Test #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
	FAIL	The remote DS1 endpoint is out-of-service. **1** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote endpoint. **2** If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint.
1794	FAIL	The DS1 Interface circuit pack detects a Line Loopback Alarm (LLB). **1** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. **2** If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **3** If the DS1 interface circuit pack connects directly to a line-side terminating device (for example, a PRI terminal adapter), call the vendor of the terminating device to diagnose the equipment.
1795	FAIL	The DS1 Interface circuit pack detects a Payload Loopback Alarm (PLB). If the DS1 Interface circuit pack connects to a leased T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 Interface circuit pack connects directly to another DS1 board, call the system technician of the remote switch to diagnose the DS1 endpoint.

Table 330: Test #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	Remote DS1 endpoint is in-service. Neither a Blue alarm nor a Line Loopback alarm nor a Payload Loopback alarm is detected in the DS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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Red Alarm Inquiry Test (#140)

DS1 Interface circuit pack raises a Red alarm when the framing pattern of the incoming DS1 bit stream has been lost. The Red Alarm Inquiry test checks the framing status of a DS1 Interface circuit pack. DS1 Interface circuit pack takes 3 seconds to recognize and report a Red alarm and 10 seconds to recognize and report the resolution of a Red alarm.

When the DS1 Interface circuit pack detects a Red alarm, the circuit pack will transmit a Yellow alarm to the remote DS1 endpoint and send a RED ALARM message to the maintenance software. After the Red alarm is confirmed, the maintenance software places all trunks of the circuit pack into the out-of-service state. The inquiry test will be run every 10 minutes until the Red alarm is cleared.

When the Red alarm is cleared, the DS1 Interface circuit pack will stop transmitting the Yellow alarm to the remote DS1 endpoint. The maintenance software restores all trunks of the DS1 Interface circuit pack to the service state before the Red alarm occurs.

Loss of Multiframe Alarm: If the DS1 Interface circuit pack is administered using DMI-BOS signaling, the DS1 Interface circuit pack raises a Loss of Multiframe Alarm (LMA) when it cannot interpret the incoming signaling bits to synchronize to the multiframe pattern received in the 24^{th} channel. Once DS1 Interface circuit pack detects an LMA, the circuit pack will transmit a Remote Multiframe Alarm (RMA) to the remote DS1 endpoint. Maintenance software handles both Red alarm and LMA alarm(s) using the same mechanism.

Table 331: Test #140 Red Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
	FAIL	The DS1 Interface circuit pack detects a Red alarm. An out-of-frame condition occurs on the DS1 Interface circuit pack. DS1 Interface circuit pack will transmit a Yellow alarm to the remote DS1 endpoint until the Red alarm is retired. **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSUs are administered correctly. **2** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **3** Check the physical connectivity of the DS1 pack and of the cable. **4** If this continues to fail, escalate this problem.

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Table 331: Test #140 Red Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The DS1 interface circuit pack detected a loss of multiframe alarm (LMA). An out of frame condition occurred on the DS1 interface circuit pack. The DS1 interface circuit pack will transmit a remote multiframe alarm (RMA) to the remote DS1 endpoint until the LMA is retired. **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSUs are administered correctly. **2** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **3** Check the physical connectivity of the DS1 pack and of the cable. **4** If this continues to fail, escalate this problem.
	PASS	No Red alarm is detected on DS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Yellow Alarm Inquiry Test (#141)

Receiving a Yellow alarm from remote DS1 endpoint indicates that the remote DS1 endpoint has an out-of-frame condition. The Yellow Alarm Inquiry test is used to determine whether the remote DS1 endpoint is transmitting a Yellow alarm. The DS1 Interface circuit pack takes ½ second to recognize and report either a:

- Yellow alarm condition
- Cleared Yellow alarm condition

When the DS1 Interface circuit pack detects a Yellow alarm from the remote DS1 endpoint, it will send a YELLOW-ALARM uplink message to the maintenance software. After the maintenance software

receives the YELLOW-ALARM message, the Yellow Alarm Inquiry test is run to confirm the Yellow alarm. Once the Yellow alarm is confirmed, the maintenance software places all trunks on the circuit pack into the out-of-service state. The Inquiry test will be run every 10 minutes until the Yellow alarm is cleared.

When the Yellow alarm is cleared, the maintenance software restores all trunks on the DS1 Interface circuit pack back to their previous service state before the Yellow alarm is raised.

This Yellow Alarm corresponds to the yellow F2 state documented in CCITT recommendation I.431.

Remote Multiframe Alarm: Remote Multiframe Alarm (RMA) indicates that the remote DS1 endpoint is in a Loss of Multiframe Alarm condition while the DS1 Interface circuit pack is administered using the DMI-BOS common-channel signaling. The RMA is handled as a Yellow alarm.

Yellow F5 State Alarm: For 32-channel E1 operation with CRC4 on, the F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431

Table 332: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may appear. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.

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Table 332: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	The DS1 interface circuit pack detected a yellow alarm sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint.
1	FAIL	The DS1 Interface circuit pack detects a Remote Multiframe Alarm sent by the remote DS1 endpoint. An out-of-frame condition occurs on the remote DS1 endpoint.
2	FAIL	The DS1 Interface circuit pack is reporting a yellow F5 State alarm. There is a fault in the user-network interface from the user (PBX) to the network. **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Likewise, verify that any intermediate CSUs are administered correctly. **2** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **3** Check the physical connectivity of the DS1 pack and of the cable. **4** If this continues to fail, escalate this problem.
	PASS	No Yellow alarm nor Remote Multiframe Alarm nor F5 State Alarm is received from the remote DS1 endpoint.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Major Alarm Inquiry Test (#142)

The Major alarm raised by a DS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1000. The Major Alarm Inquiry test is used to determine that the received DS1 bit error rate is greater than 1/1000. When D4 framing mode is selected, the DS1 Interface circuit pack takes 16 seconds to recognize and report a Major alarm and 16 seconds to recognize and report that

a Major alarm condition is cleared. If ESF framing mode is selected, the DS1 Interface circuit pack takes 10 seconds to recognize and report a Major alarm and 10 seconds to recognize and report that a Major alarm condition is cleared.

When the DS1 Interface circuit pack detects a Major alarm, it will send a MAJOR-ALARM message to the maintenance software. After the maintenance software receives a MAJOR-ALARM message, the Major Alarm Inquiry test is initiated to confirm the Major alarm on the DS1 Interface circuit pack. The Inquiry test will be run every 10 minutes until the Major alarm is cleared. The maintenance software places all trunks on the circuit pack in the out-of-service state if the Major alarm persists for more than 20 minutes.

When the Major alarm is cleared, the maintenance software restores all trunks on the circuit pack to their previous service state before a Major alarm occurs.

Table 333: Test #142 Major Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.

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Table 333: Test #142 Major Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	The DS1 Interface circuit pack detects a Major alarm. The DS1 bit error rate is greater than 1/1000. **1** The performance of DS1 link between DS1 Interface circuit pack and remote DS1 endpoint is very poor. If the DS1 Interface circuit pack is TN767, enter **list measurement ds1-log *UUCSS*** command to read the error seconds measurement. **2** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **3** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **4** Check the physical connectivity of the DS1 pack and of the cable. **5** Replace the local DS1 interface circuit pack, and repeat the test.
	PASS	No Major alarm is detected in DS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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Minor Alarm Inquiry Test (#143)

The Minor alarm raised by a DS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1,000,000, but less than 1/1000. The Minor Alarm Inquiry test is used to determine that the received DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. When D4 framing mode is selected, the DS1 Interface circuit pack takes 41 minutes to recognize and report a Minor alarm and 41 minutes to recognize and report that a Minor alarm condition is cleared. If ESF framing mode is selected, the DS1 Interface circuit pack takes 10 minutes to recognize and report a Minor alarm and 10 minutes to recognize and report that a Minor alarm condition is cleared.

When the DS1 Interface circuit pack detects a Minor alarm condition, it will send a MINOR-ALARM message to the maintenance software. After the maintenance software receives a MINOR-ALARM message, the Minor Alarm Inquiry test is initiated to confirm the Minor alarm. All trunks on the circuit pack are kept in the in-service state after the Minor alarm is confirmed. The Minor Alarm Inquiry test is run every 10 minutes until the Minor alarm is cleared.

Table 334: Test #143 Minor Alarm Inquiry Tests

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
	FAIL	The DS1 Interface circuit pack detects a Minor alarm. The DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. **1** The performance of DS1 link between DS1 Interface circuit pack and remote DS1 endpoint is poor. If DS1 Interface circuit pack is TN767, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **2** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **3** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **4** Check the physical connection of the DS1 pack and of the cable. **5** If this continues to fail, escalate this problem.

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Table 334: Test #143 Minor Alarm Inquiry Tests

Error Code	Test Result	Description / Recommendation
	PASS	No Minor alarm is detected in DS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

Slip Alarm Inquiry Test (144)

Slips occur when transmitter and receiver are not running at precisely the same clock rate. The DS1 Interface circuit pack can detect both positive and negative slips on the DS1 facility. The Slip Alarm Inquiry test is used to acquire the total number of slips occurred on a DS1 link.

When the DS1 Interface circuit pack detects a slip condition, the circuit pack will increase the on-board slip counter by 1. A SLIP-COUNT message is spontaneously sent to the system software after the counter reaches a threshold (for example, 88). When the maintenance software receives the SLIP-COUNT message, the Slip Alarm Inquiry test is initiated to query the slip counters on DS1 Interface circuit pack and total the slip counts in the maintenance software.

If the count of slips is over the threshold, a Minor alarm is raised against the DS1 Interface circuit pack. All trunks of the DS1 Interface circuit pack are still in the in-service state. If the DS1 Interface circuit pack is used to supply the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See "TDM-BUS" and "SYNC (Synchronization)" for details.

Table 335: Test #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

Table 335: Test #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
1 to 88	FAIL	The DS1 interface circuit pack detected a slip alarm. The error code equals the number of slips detected by the DS1 interface circuit pack since the last slip alarm inquiry test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the DS1 interface circuit pack is a TN767, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that both endpoints and all intermediate equipment of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **4** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **5** Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors. **6** Check the physical connectivity of the DS1 pack and of the cable. **7** If this continues to fail, escalate this problem.

Table 335: Test #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	No Slip alarm is detected on the DS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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Misframe Alarm Inquiry Test (#145)

Misframe Alarm indicates that framing bits observed on a DS1 Interface circuit pack are in error. Misframe Alarm Inquiry test queries the total number of misframes that occurred on a DS1 Interface circuit pack since the last inquiry.

When the DS1 Interface circuit pack detects a misframe error, it will increase its misframe counter by 1. If the counter reaches the threshold, a MISFRAME-COUNT message is automatically sent to the switch maintenance software. After the maintenance software receives the MISFRAME-COUNT message, the Misframe Alarm Inquiry test is initiated to collect the misframe counts from the DS1 Interface circuit pack.

When the threshold of misframes is reached, if the DS1 Interface circuit pack is supplying the system synchronization source, then a switching synchronization source message is sent to the TDM Bus Clock. See TDM-BUS (TDM Bus) Maintenance documentation for details. A Minor alarm against the DS1 Interface circuit pack is raised, but all trunks of the DS1 Interface circuit pack are still in the in-service state.

Table 336: Test #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 336: Test #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may appear. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
ANY	FAIL	The test failed because the DS1 interface circuit pack detected errors in the received framing bits pattern. The error code equals the number of misframes detected by the DS1 interface circuit pack since the last misframe alarm inquiry test. Major bit and minor bit error rate (error types 2561 and 2817) error logs often accompany misframe alarms. Clearing the cause of these error logs may clear the misframes that are occurring. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the DS1 interface circuit pack is a TN767, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that both endpoints and all intermediate equipment of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **4** If the DS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the DS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. **5** Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors. **6** Check the physical connection of the DS1 pack and of the cable. **7** If this continues to fail, escalate this problem.
	PASS	No Misframe alarm is detected on the DS1 Interface circuit pack.

Table 336: Test #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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Translation Update Test (#146)

The Translation Update test sends the circuit pack-level information specified by System Administration to the DS1 Interface circuit pack. Translation includes the following data administered for a DS1 Interface circuit pack (see output of **display ds1 *UUCSS*** command): DS1 Link Length between two DS1 endpoints, Synchronization Source Control, All Zero Suppression, Framing Mode, Signaling Mode, time-slot number of 697-Hz tone, time-slot number of 700-Hz tone, etc.

If a TN767E or later DS1 circuit pack is combined with a 120A CSU module or a T1 sync splitter to screen an integrated CSU module, this test will also send the administration for this Integrated CSU to the circuit pack to assure the board's translations are correct. The administration of the CSU module is done using the DS1 circuit pack administration screen. Translation for the CSU module includes the following data: Transmit LBO, Receive ALBO, Supply CPE loop-back jack Power?, and so forth.

Table 337: Test #146 Translation Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system software error. **1** Enter **display ds1 *UUCSS*** to verify the DS1 Interface circuit pack translation.

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Table 337: Test #146 Translation Update Test

Error Code	Test Result	Description / Recommendation
	PASS	Translation data has been downloaded to the DS1 Interface circuit pack successfully.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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DS1 Board Loop-Back Test (#1209)

This test is **destructive**.

The DS1 BLB (Board Loopback) test causes a loop back at the TN767E DS1 board edge, and tests DS1 board internal circuitry.

The test is destructive and is initiated by a technician-demanded **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.

All trunks or ports on the DS1 Interface circuit pack must be busied out using **busyout board** before running the BLB test.

When the BLB test is initiated, maintenance software sends a message to the TN767E DS1 Interface circuit pack to start the test. The board sets up the BLB loop back, transmits a test pattern, and verifies that the pattern is received unaltered through the loop back. If the transmitted and received pattern is different, the test fails.

When the test is complete, enter **release board** to restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 338: Test #1209 DS1 Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	DS1 Board Loopback test cannot be executed in the current configuration. To run this test, the TN767E (or higher-suffixed) DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit via the following command sequence: **1** Issue the **disable synchronization-switch** command. **2** Next, issue the **set synchronization *UUCSS*** command. **3** Lastly, issue the **enable synchronization-switch** command.
1950	ABORT	Another loop-back/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (Line loop back or Payload loop back). The hardware error log will indicate whether a Customer loop-back jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loop-back or payload loop-back mode. Only one long-duration loop-back/span test can be active at a given time. Thus, if a loop-back/span test is already active, that test must be deactivated via the *test* **ds1-loop *UUCSS* end-loopback/span-test** command in order to execute this test.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 338: Test #1209 DS1 Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
	FAIL	DS1 Interface circuit pack failed the DS1 Board Loopback test. **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the BLB test continues to fail, then replace the DS1 circuit pack.
	PASS	The BLB test executed successfully. The test pattern was transmitted and received successfully up to the TN767E DS1 board edge.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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CSU Equipment Loop-Back Test (#1210)

This test is **destructive**.

The CSU ELB (Equipment Loopback) test causes a loop back at the near-edge of the local 120A CSU module or T1 sync splitter, and tests the connection from the TN767E DS1 board to the CSU module/T1 sync splitter (DS1 board edge interconnecting cable, and CSU module/T1 sync splitter edge). This test will only be performed if the 120A CSU module/T1 sync splitter is present, administered, and connected to a 1.544-Mbps TN767E DS1 circuit pack behind the port carrier.

The test is destructive and can only be initiated by a technician-demanded **test ds1-loop *UUCSS* ds1/csu-loopback-tests** command.

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the ELB test.

When the ELB test is initiated, maintenance software sends a message to the TN767E DS1 Interface circuit pack to start the test. The board sets up the ELB loop back, transmits a test pattern, and verifies that the pattern is received unaltered through the loop back. If the transmitted and received pattern is different, the test fails.

The DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires that may not be detected by the loop-back pattern.

When the test is complete, use **release board** to restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 339: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	CSU Equipment Loopback test cannot be executed in the current configuration. To run this test, the `Near-End CSU Type` field on the DS1 circuit pack administration screen must be set to *integrated* and the `Bit Rate` field must be set to “1.544” (for 24-channel operation). **1** Use **change ds1 *UUCSS*** and set the `Near-End CSU Type` field on the DS1 circuit pack administration screen to **integrated**, and/or set the `Bit Rate` field to **1.544** if the board is to be used in a 24-channel configuration. **2** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.

Table 339: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit via the following command sequence: **1** Issue the **disable synchronization-switch** command. **2** Next, issue the **set synchronization *UUCSS*** command. **3** Lastly, issue the **enable synchronization-switch** command.
1950	ABORT	Another loop-back/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (Line loop back or Payload loop back). The hardware error log will indicate whether a Customer loop-back jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loop-back or payload loop-back mode. Only one long-duration loop-back/span test can be active at a given time. Thus, if a loop-back/span test is already active, that test must be deactivated via the **test ds1-loop *UUCSS* end-loopback/span-test** command in order to execute this test.
1951	ABORT	The CSU Equipment Loopback test could not be executed because the 120A CSU module/T1 sync splitter was not physically installed. Physically connect the 120A CSU module/T1 sync splitter to the TN767E board behind the port carrier.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 339: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
	FAIL	DS1 Interface circuit pack failed the CSU Equipment Loopback test. **1** Retry **test ds1-loop UUCSS ds1/csu-loopback-tests**. **2** If the ELB test continues to fail, then either the TN767E board, the CSU module/T1 sync splitter, or the I/O cable between the backplane and the 120A1 CSU module or the 401A T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Replace the CSU module/T1 sync splitter, and run **test ds1-loop UUCSS ds1/csu-loopback-tests** again. **3** If the ELB test continues to fail, then replace the TN767E board and run **test ds1-loop UUCSS ds1/csu-loopback-tests** again. **4** If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the 120A1 CSU module or the 401A T1 sync splitter.

Table 339: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
	PASS	The ELB test executed successfully. The test pattern was transmitted and received successfully over the connection from the TN767E DS1 board to the near-edge of the 120A1 CSU module/T1 sync splitter.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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CSU Repeater Loop-Back Test (#1211)

This test is **destructive**.

The CSU RLB (Repeater Loopback) test causes a loop back at the far-edge of the local 120A CSU module or T1 sync splitter, and tests the connection from the TN767E DS1 board to and including the CSU module/T1 sync splitter circuitry. The test runs only if the 120A CSU module/T1 sync splitter is present, administered, and connected to a 1.544-Mbps TN767E DS1 circuit pack behind the port carrier.

The test is destructive and can only be initiated by **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the RLB test.

When the RLB test is initiated, maintenance software sends a message to the TN767E DS1 Interface circuit pack to start the test. The board sets up the RLB loop back, transmits a test pattern, and verifies that the pattern is received unaltered through the loop back. If the transmitted and received pattern is different, the test fails.

The DS1 circuit pack hardware applies a DC current while the test is running in order to detect any broken wires that may not be detected by the loop-back pattern.

When the test is complete, use **release board** to restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 340: Test #1211 CSU Repeater Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop UUCSS ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	CSU Repeater Loopback test cannot be executed in the current configuration. **1** Use **change ds1 *UUCSS*** snd set the `Near-End CSU Type` field on the DS1 circuit pack administration screen to **integrated**, and/or set the `Bit Rate` field to **1.544** if the board is to be used in a 24-channel configuration. **2** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit via the following command sequence: **1** Issue the **disable synchronization-switch** command. **2** Next, issue the **set synchronization *UUCSS*** command. **3** Lastly, issue the **enable synchronization-switch** command.
1950	ABORT	Another loop-back/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (Line loop back or Payload loop back). The hardware error log indicates whether a Customer Loopback Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loop-back or payload loop-back mode. Only one long-duration loop-back/span test can be active at a given time. Thus, if a loop-back/span test is already active, that test must be deactivated via **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.
1951	ABORT	The CSU Repeater Loopback test could not be executed because the 120A CSU module/T1 sync splitter was not physically installed. Physically connect the 120A1 CSU module/T1 sync splitter to the TN767E board behind the port carrier.

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Table 340: Test #1211 CSU Repeater Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
	FAIL	DS1 Interface circuit pack failed the CSU Repeater Loopback test. **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the RLB test continues to fail, and the CSU Equipment Loopback test (#1210) passed, then replace the CSU module/T1 sync splitter.

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Table 340: Test #1211 CSU Repeater Loop-Back Test

Error Code	Test Result	Description / Recommendation
	PASS	The RLB test executed successfully. The test pattern was transmitted and received successfully over the connection from the TN767E DS1 board to the far-edge of the 120A1 CSU module/T1 sync splitter.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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CPE Loopback Jack Test (#1212)

This test is **destructive**.

The CPE Loopback Jack (CLJ-LB) test causes a loop back at the CPE loop-back jack and tests the building wiring connection between the TN767E DS1 board and the CPE loop-back jack.

The test is highly destructive and can only be initiated by a technician-demanded **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin [*number-of-bits bit-pattern*]** command. The system technician can either enter a loop-back activation code on the command line or use the default code (0x47F).

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the CPE Loopback Jack test.

The CPE Loopback Jack test has the TN767E DS1 Interface circuit pack transmit a loop-back activation code to the CPE loop-back jack, waits up to 10 seconds for return of the code to verify the loop back has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result to indicate that the pattern was successfully sent. If the loop back is not established within the 10 seconds, the test returns FAIL.

The status of the CPE Loopback Jack test appears in the hardware error log via Error Type #3900. Several distinct aux values give information on the status of the test.

Use **list measurements ds1 summary** to show the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is passed through the loop back cleanly, the number of bit errors should be very

low. The command also shows the type of loop-back/span test executing (`Test` field), the type of pattern generated for the loop-back/span test (`Pattern` field), and whether the pattern (*3-in-24 Pattern*) is synchronized (`Synchronized` field).

Use **test ds1-loop *UUCSS* end-loopback/span-test** to end the test.

Table 341: Test #1212 CPE Loopback Jack Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	CPE Loopback Jack test cannot be executed in the current configuration. To run this test, the TN767E (or higher-suffixed) DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter the **busyout board *UUCSS*** command to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit via the following command sequence: **1** Issue the **disable synchronization-switch** command. **2** Next, issue the **set synchronization *UUCSS*** command. **3** Lastly, issue the **enable synchronization-switch** command.
1950	ABORT	Another loop-back/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (Line loop back or Payload loop back). The hardware error log will indicate whether a Customer loop-back jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loop-back or payload loop-back mode. Only one long-duration loop-back/span test can be active at a given time. Thus, if a loop-back/span test is already active, that test must be deactivated via the **test ds1-loop *UUCSS* end-loopback/span-test** command in order to execute this test.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 341: Test #1212 CPE Loopback Jack Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
2	FAIL	The CLJ-LB test failed because it was not set up properly. The DS1 interface pack could not successfully put the CPE loop-back jack into loop-back mode. **1** Rerun **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin**. **2** If the test continues to fail, the problem could be with the TN767E board, the CPE loop-back jack equipment, or somewhere between. Run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** to determine if the loop-back tests that are closer to the TN767E board are successful. If any of the tests fail, follow the maintenance strategy that is associated with the failing test.
3	FAIL	The CPE Loopback Jack test was not set up properly. The framed 3-in-24 test pattern, generated by the DS1 Interface circuit pack and looped back through the CPE loop-back jack, could not be detected properly by the DS1 circuit pack. **1** Retry **test ds1-loop UUCSS cpe-loopback-jack-test-begin**. **2** If the CPE Loopback test continues to fail, the problem could be with the TN767E board, the CPE loop-back jack equipment, or somewhere in between. Run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** to see if the loop-back tests closer to the TN767E board are successful. If any of those loop-back tests fail, follow the maintenance strategy associated with those.

Table 341: Test #1212 CPE Loopback Jack Test

Error Code	Test Result	Description / Recommendation
	PASS	The CPE Loopback Jack test has successfully began executing. The test runs until the system technician enters the **test ds1-loop *UUCSS* end-loopback/span-test** or **release board *UUCSS***.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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Far CSU Loop-Back Test (#1213)

This test is **destructive**.

The Far CSU Loopback (R-LLB) test causes a loop back at the far-end CSU, and tests all circuitry and facilities from the local TN767E DS1 board to the far-end CSU.

The test is destructive and can only be initiated by a technician-demanded **test ds1-loop *UUCSS* far-csu-loopback-test-begin** command.

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the Far CSU Loopback test.

If the far-end CSU is not a 120A CSU module or a 401A T1 sync splitter, and the DS1 is administered for ami-zcs line coding, disable density protection on the CSU during the test, due to the large number of zero's in the 3-in-24 test pattern.

The Far CSU Loopback test has the TN767E DS1 Interface circuit pack transmit a loop-back activation code to the remote CSU, waits up to 15 seconds for return of the code to verify the loop back has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result. If the loop back is not established within the 15 seconds, the test fails.

The status of the Far CSU Loopback test appears in the hardware error log via Error Type #3901. Several aux values give information on the status of the test.

Use **list measurements ds1 summary** to show the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is passed through the loop back cleanly, the number of bit errors should be very low. The command also shows the type of loop-back/span test executing (`Test` field), the type of pattern generated for the loop-back/span test (`Pattern` field), and whether the pattern (*i.e., 3-in-24 Pattern*) is synchronized (`Synchronized` field).

Use **test ds1-loop *UUCSS* end-loopback/span-test** or **release board** to end the test. Use **release board** to restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 342: Test #1213 Far CSU Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop UUCSS far-csu-loopback-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	Far CSU Loopback test cannot be executed in the current configuration. To run this, the TN767E (or higher-suffixed) DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit via the following command sequence: **1** Issue the **disable synchronization-switch** command. **2** Next, issue the **set synchronization *UUCSS*** command. **3** Lastly, issue the **enable synchronization-switch** command.
1950	ABORT	Another loop-back/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (Line loop back or Payload loop back). The hardware error log will indicate whether a Customer Loopback Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loop-back or payload loop-back mode. Only one long-duration loop-back/span test can be active at a given time. Thus, if a loop-back/span test is already active, that test must be deactivated via the **test ds1-loop *UUCSS* end-loopback/span-test** command in order to execute this test.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 342: Test #1213 Far CSU Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.

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Table 342: Test #1213 Far CSU Loop-Back Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The far CSU Loopback test was not set up properly. The DS1 Interface circuit pack could not put the far-end CSU into loop-back mode.
3	FAIL	The far CSU Loopback test was not set up properly. The framed 3-in-24 test pattern, generated by the DS1 Interface circuit pack and looped back through the far-end CSU, could not be detected by the DS1 circuit pack. **1** Retry **test ds1-loop *UUCSS* far-csu-loopback-test-begin**. **2** If the Far CSU Loopback test continues to fail with this error code, the problem could be with the TN767E board, the far-end CSU equipment, or somewhere in between. Run **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin** to see if the CPE Loopback Jack test that is closer to the TN767E board is successful. If a CPE loop-back jack device is not being used, run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** to see if the closer loop-back tests succeed. If the closer loop-back test fails, follow the maintenance strategy associated with that loop back
	PASS	The Far CSU Loopback test has successfully began executing. The test runs until the system technician enters **test ds1-loop *UUCSS* end-loopback/span-test** or the **release board *UUCSS***.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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One-Way Span Test (#1214)

This test is **destructive**.

The One-Way Span test allows 1-way span testing to and from remote test equipment or another Communication Manager solution. This tests all circuitry and facilities from the local TN767E DS1 board to the remote test equipment or other Communication Manager solution.

The test is destructive and can only be initiated by a technician-demanded **test ds1-loop *UUCSS* one-way-span-test-begin** command.

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the One-Way Span test.

The One-Way Span test has the TN767E DS1 Interface circuit pack transmit a framed 3-in-24 test pattern and attempts to receive and verify the pattern. If the TN767E board receives a framed 3-in-24 test pattern sent from another Communication Manager system or test equipment at the far end of the DS1, it begins counting bit errors within the received pattern.

NOTE:
G700: When a TN464 and an MM710 are connected, the One-Way Span test does not frame-align to the 3-in-24 repetitive pattern, and the test fails.

The status of the One-Way Span test appears in the hardware error log via Error Type #3902. Several aux values give information on the status of the test.

Use **list measurements ds1 summary** to see the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is sent cleanly over the span from the far end, the number of bit errors should be very low. The `Test Duration` field is **0** until the test pattern is received from the far end. Upon receiving the test pattern, the board begins calculating the test duration and number of bit errors. The command also shows the type of loop-back/span test executing (`Test` field), the type of pattern generated for the loop-back/span test (`Pattern` field), and whether the pattern (*i.e., 3-in-24 Pattern*) is synchronized (`Synchronized` field).

Use **test ds1-loop *UUCSS* end-loopback/span-test** or the **release board** to end the test. Use **release board** to restore all trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 343: Test #1214 One-Way Span Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* one-way-span-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	One-Way Span test cannot be executed in the current configuration. To run this, the TN767E (or higher-suffixed) DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to “1.544” for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.

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Table 343: Test #1214 One-Way Span Test

Error Code	Test Result	Description / Recommendation
1039	ABORT	The DS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the DS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the Tone-Clock circuit via the following command sequence: **1** Issue the **disable synchronization-switch** command. **2** Next, issue the **set synchronization *UUCSS*** command. **3** Lastly, issue the **enable synchronization-switch** command.
1950	ABORT	Another loop-back/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (Line loop back or Payload loop back). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line loop-back or payload loop-back mode. Only one long-duration loop-back/span test can be active at a given time. Thus, if a loop-back/span test is already active, that test must be deactivated via the **test ds1-loop *UUCSS* end-loopback/span-test** command in order to execute this test.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
G700:	FAIL	Test was run between a TN464 and an MM710, which generate incompatible patterns.

Table 343: Test #1214 One-Way Span Test

Error Code	Test Result	Description / Recommendation
	PASS	The One-Way Span test has successfully began transmitting a framed 3-in-24 test pattern. The test will continue to run until the system technician enters **test ds1-loop *UUCSS* end-loopback/span-test** or **release board *UUCSS***.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

3 of 3

Inject Single Bit Error Test (#1215)

This test is **destructive**.

The Inject Single Bit Error test causes a single bit error to be sent within an active framed 3-in-24 test pattern.

The test is highly destructive and can only be initiated by a technician-demanded **test ds1-loop *UUCSS* inject-single-bit-error** command. An attempt to use this command is rejected if none of the three long-duration DS1 loop-back/span tests (CPE Loopback Jack test, Far CSU Loopback test, One-Way Span test) are active on a TN767E circuit pack.

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running the Inject Single Bit Error test.

Use **list measurements ds1 summary** to show the number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). Injecting this single bit error should increment the bit error count of the loop-back/span test by one.

Use **release board** to restore the trunks or ports on the TN767E DS1 Interface circuit pact to the inservice state.

Table 344: Test #1215 Inject Single Bit Error Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* inject-single-bit-error** at 1-minute intervals up to 5 times.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.

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Table 344: Test #1215 Inject Single Bit Error Test

Error Code	Test Result	Description / Recommendation
	PASS	A single bit error has been successfully injected into an active framed 3-in-24 test pattern.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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End Loopback/Span Test (#1216)

This test is **destructive**.

The End Loopback/Span test deactivates an active loop-back or span test on a TN767E DS1 circuit pack. Bit error counting against the received test pattern stream halts, and sending of the framed 3-in-24 test pattern ceases. If either the CPE loop-back jack or the far-end CSU is looped, the loop-back deactivate code is sent. If the loop back could not be deactivated, the test will FAIL and a MINOR alarm is noted in the alarm log until the loop back is cleared.

The test is highly destructive and can only be initiated by a technician-demanded **test ds1-loop *UUCSS* end-loopback/span-test** command. Since only one of these three different long-duration loop-back/span tests can be active at a time, the TN767E circuit pack knows which loop-back/span test to halt.

Use **busyout board** to busy out all trunks or ports on the DS1 Interface circuit pack before running this End Loopback/Span test.

Use **list measurements ds1 summary** to show the length of time the test ran (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field).

Use **release board** to restore the trunks or ports on the TN767E DS1 Interface circuit pack to the in-service state.

Table 345: Test #1216 End Loopback/Span Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* end-loopback/span-test** at 1-minute intervals up to 5 times.
1005	ABORT	End Loopback/Span test cannot be executed in the current configuration. To run this, the TN767E (or higher-suffixed) DS1 must be administered for 24-channel operation. The `Bit Rate` field on the DS1 circuit pack administration screen must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the DS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put all trunks or ports of the DS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service and one or more of the following symptoms may be exhibited. • The DS1-BD tests (such as test 138 and test 139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no board result. • A **busyout** or a **release** command has no affect on the test results. • A **list config** command shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the DS1 interface circuit pack is restored to normal operation. Every DS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, escalate this problem.
1313	FAIL	The TN767E DS1 circuit pack could not deactivate the loop back through the Customer loop-back jack. **1** Retry **test ds1-loop *UUCSS* end-loopback/span-test** at 1-minute intervals up to 5 times.

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Table 345: Test #1216 End Loopback/Span Test

Error Code	Test Result	Description / Recommendation
1314	FAIL	The TN767E DS1 circuit pack could not deactivate the loop back through the far-end CSU. **1** Make sure that the far-end DS1 is installed if the far-end CSU is a 120A CSU module/T1 sync splitter. **2** Retry **test ds1-loop *UUCSS* end-loopback/span-test** at 1-minute intervals up to 5 times.
	PASS	The active long-duration loop-back or span test on the TN767E circuit pack was successfully deactivated.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, use **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the link between the internal ID and the port.

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ICSU Status LEDs Test (#1227)

The TN767E DS1 circuit pack has four status LEDs on the faceplate in addition to the three standard faceplate LEDs. These four status LEDs are associated with the 120A1 Channel Service Unit (CSU) Module that can be connected to the TN767E board via the I/O connector panel behind the port carrier.

This test is a visual test. It lights the four status LEDs red for 5 seconds, green for 5 seconds, and yellow for 5 seconds. It then turns the LEDs off and returns control of the status LEDs to the circuit pack.

This test runs only on TN767E (or higher-suffixed) DS1 circuit packs administered for 24-channel operation (1.544 Mbps).

If the 1201 CSU module/T1 sync splitter is not installed, the status LEDs are always off and this test aborts.

Table 346: Test #1227 ICSU Status LEDs Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The ICSU Status LEDs test cannot be executed for the current configuration. The test applies only to TN767E or later DS1 circuit packs administered for 24-channel (1.544-Mbps) operation. **1** If the circuit pack is a TN767E (or higher-suffixed) DS1 circuit pack, then retry the command.
1951	ABORT	The ICSU Status LEDs test cannot be executed because a 120A1 (or higher-suffixed) CSU module or a 401A (or higher-suffixed) T1 sync splitter is not physically installed. If using a 120A1 CSU module/T1 sync splitter, physically connect it to the TN767E board behind the port carrier. Otherwise, ignore this abort.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. **1** Retry the command.
	PASS	The ICSU Status LEDs test executed successfully. A PASS result, however, does not necessarily mean that the status LEDs behaved properly. It only means that the software successfully attempted to light the status LEDs. This is a visual test. The service technician must visually exam the behavior of the LEDs while the test is running. The LEDs are functioning properly if the four status LEDs are lit red for 5 seconds, then lit green for 5 seconds, then lit yellow for 5 seconds. If the LEDs behave differently, escalate this problem.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Use **add ds1 *UUCSS*** to administer the DS1 interface if it is not already administered. **2** If board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

DS1-FAC (DS1 Facility)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DS1-FAC	MAJOR	**test board *location* sh r 1**	DS1 Facility
DS1-FAC	MINOR	**test board *location* sh r 1**	DS1 Facility
DS1-FAC	WARNING	**test board *location* sh r 1**	DS1 Facility

1 For information on specifying a ***location***, see Command Syntax on page 179. See Chapter 7, or the DS1C-BD section, for identification of DS1 facility LEDs.

The DS1-FAC is a part of the DS1 Converter (DS1C-BD) complex. The DS1C-BD complex consists of two TN574 DS1C-BD circuit packs or two TN1654 DS1C-BD circuit packs connected by one to four DS1 facilities. The MO name for the DS1 converter circuit pack is DS1C-BD, and the MO name for the connected DS1 facilities is DS1-FAC.

The TN1654 DS1 Converter circuit pack is a redesign of the TN574 DS1 Converter board. The TN1654 provides functionality equivalent to the TN574, and adds a 32-channel E1 interface for international support as well as circuit-switched wideband connections (NxDS0).

The TN1654 DS1 converter circuit pack is not compatible with the TN574 DS1 converter board or the Y-cable used to interface to the TN574 DS1 converter. A TN573B (or higher-suffixed) SNI board must be used when connecting to the TN1654 DS1 converter board. See DS1C-BD for information about both DS1 converter circuit packs.

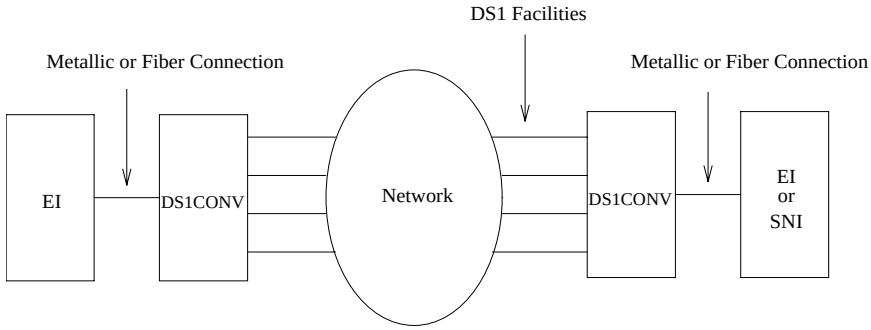
The DS1 converter complex is a part of the port-network connectivity (PNC). The DS1 converter complex is used to extend the range of the 32-Mbps fiber links that connect PNs to the Center Stage Switch, allowing PNs to be located at remote sites.

The DS1 converter circuit pack contains on-board firmware that detects DS1 facility alarms and errors, communicates status to maintenance software, and runs either background or on-demand tests from maintenance software. The overall maintenance software strategy includes demand tests, recovery strategies, error and alarm logging, and periodic audits.

Every error condition reported by the firmware is associated with the background tests that the firmware runs autonomously. Demand tests that are executed by the maintenance software do not have any functionality that would effect any additional error manipulation by the firmware. However, the Failure Audit test (#949) affects auditing of the software error log by forcing the firmware to report the pending errors again.

DS1 converter circuit packs are connected to the Expansion Interface (EI) circuit packs (TN570) and the Switch Node Interface (SNI) circuit packs (TN573) as shown in Figure 50, DS1 Converter Complex and the DS1 Facilities, on page 821.

Figure 50: DS1 Converter Complex and the DS1 Facilities



The DS1 converter complex can replace fiber links between two EIs and fiber links between an PN's EI and an SNI. Fiber links between two SNIs and fiber links between the and the Center Stage Switch (CSS) cannot be replaced by a DS1 converter complex.

On the TN574 DS1 converter circuit pack, one of the four DS1 facilities is used as the primary facility (or packet facility), and it is the only facility that can carry packet traffic besides providing circuit connections. The primary facility has 22 channels available for circuit and packet connections. Other facilities each have 24 channels available for circuit connections. On the TN574 primary facility, channels 1and 24 are not available for packet or for circuit connections. Channel 1 is used for excess packets traffic to prevent packet overflow that might result from zero code substitutions. Channel 24 is the DS1 control channel that carries control link data between the two DS1 converter circuit packs.

The primary facility on the TN1654 DS1 converter circuit pack is restricted to facility A or facility B. The TN1654 provides fixed packet bandwidth of 192 kbps while the TN574 provides packet bandwidth of up to 1408 kbps with a dynamic allocation mechanism that could change packet/circuit use of individual channels. The first three 64-kbps channels on the primary facility of the TN1654 are reserved as the packet channels. The DS1 control channel will be Channel 24 in T1 mode and Channel 31 in E1 mode. In T1 format the TN1654 provides 24 circuit channels for use on non-primary facilities and 20 circuit channels on the primary facility. E1 format provides 31 circuit channels for use on non-primary facilities and 27 circuit channels on the primary facility.

When there are alarms on the packet facility, DS1 converter circuit pack firmware changes the mapping of the DS1 channels to move the packet traffic to another facility. On TN574 DS1 converter boards, the packet traffic will be moved to another "Digital Data Compatible" facility (as indicated on the fiber link administration screen). On TN1654 DS1 converter boards, the packet traffic will be moved to either facility A or B if available. This mapping is done to keep the packet service operational at all times as the system control links are carried on these packet connections. When packet traffic is moved to another facility, circuit connections on the new facility are torn down and circuit connections on the old (faulty) facility are re-mapped to the new packet facility.

After firmware initialization, facility A, the first facility, is chosen as the default primary facility for both DS1 converter boards.

The TN574 DS1 converter has seven LEDs that provide an indication of the state of the DS1 converter circuit pack and the DS1 facilities. There is a yellow, a green, and a red LED under software and/or firmware control. There are four Green LEDs under hardware control that indicate, for each DS1 facility, whether a receive signal is present for the DS1 facility. From top to bottom these green LEDs correspond to DS1 facilities A, B, C, and D respectively. If one of the four green LED is on, it indicates a signal is

present, but it does not imply that the signal is using the correct framing format (ESF or D4) or line coding (ZCS or B8ZS). See section DS1C-BD for the description of the red, the green, and the amber LEDs on the DS1 converter circuit pack.

The TN1654 DS1 converter board has eleven LEDs on its faceplate. The top three system standard LEDs (yellow, green and red) are used to provide an indication of the state of the DS1 converter board. The bottom four LEDs on the TN1654 board are labeled SPAN LEDs. These LEDs are under firmware control. If the facility is not administered, then the LED is not lit. The LED is lit amber if the facility is running alarm free. If the facility is detecting either a red alarm (loss-of-signal or loss-of-frame), a yellow alarm (remote frame alarm) or a blue alarm (AIS signal) then the LED is lit red. See section DS1C-BD for a complete description off all the LEDs.

The TN1654 DS1 converter circuit pack supports the Wideband Switching feature. The TN574 DS1 converter does not.

DS1 Facility Busyout

Busy out the MO to gracefully disconnect service. Busyout puts the object out-of-service until the repair procedures are completed.

Use **busyout ds1-facility** to busy out DS1 facilities. When an attempt is made to busyout the packet facility (or primary facility), the system prints a warning message indicating that the **override** option must be used to busyout the packet facility. Busying out the packet facility moves the packet traffic to another facility, and disconnects circuit connections on that new facility.

The system does not allow the last packet DS1 facility to be busied out. In this case, busy out the DS1 converter circuit pack instead.

When the **busyout ds1-facility** command is executed, software communicates with both DS1 converter circuit packs in the DS1 converter complex. If the board at which the facility is being busied out is not accessible, the abort code 2100 is returned. If the board at the other end of the DS1 converter complex is not accessible, the abort code 105 is returned.

DS1 Facility Administration

DS1 facility administration is a part of the fiber link administration. DS1 options are set on the Fiber Link Administration screen. For critical-reliability systems, the Fiber Link Administration screen contains the DS1 facility options for the B side of the PNC.

DS1 facility administration is explained in the following sections. These descriptions do not provide complete coverage of fiber link administration.

Replacing a DS1 Facility

Disconnecting a DS1 facility is service disrupting except on critical-reliability systems since they have PNC duplication.

For a standard-, duplex-, or high-reliability system (no PNC duplication):

This procedure is **destructive**.

1. Use **busyout ds1-facility** to busy out the DS1 facility.
2. Replace the DS1 facility.
3. Use **release ds1-facility** to release the DS1 facility.

For a critical-reliability system (PNC duplication):

This procedure is nondestructive.

1. If the DS1 facility to be replaced is on the active PNC (its amber LED is on solid), use **reset pnc interchange** to do a PNC demand interchange. Use **status pnc** to determine the active PNC.
2. When the DS1 facility to be replaced is on the standby PNC (if the DS1 facility was originally on the standby PNC or after the PNC interchange has finished), use **busyout ds1-facility** to busyout the DS1 facility.
3. Replace the DS1 facility.
4. Use **release ds1-facility** to release the DS1 facility.

Installing a DS1 Facility

To install a DS1 facility:

1. Connect the facility.
2. Use **list fiber-link** to check the fiber link number.
3. Use **change fiber-link** to administer the DS1 facility via the command. Set the `Facility Installed` field to **y** for the facility that is being installed.
4. Use **busyout board** to busyout the DS1 converter circuit pack.
5. Use **test board *UUCSS* long** to run the DS1 Facilities Connectivity test (#790), to ensure that the facilities are connected correctly.
6. Use **release board** to release the DS1 converter circuit pack.

Removing a DS1 Facility

Removing a DS1 facility is service disrupting in any system configuration, because the DS1 facility administration is similar on both sides of the PNC on critical-reliability systems.

This procedure is **destructive**.

1. Use **busyout ds1-facility** to busyout the DS1 facility.
2. Use **list fiber-link** to check the fiber link number.
3. Use **change fiber-link** to administer the DS1 facility. Set the `Facility Installed` field to **n** for the facility that is being removed.
4. Disconnect the DS1 facility (or facilities in a critical-reliability system configuration).

DS1 Interface Options

Use fiber link administration to set the following DS1 Interface options. Use **list fiber-link** to check the number of the fiber link. Execute **change fiber-link** and set the following fields:

Facility Installed

The Facility Installed field is **y** when the facility is installed.

For TN574 DS1 converter boards, facility A must be installed first. Install Facilities B, C and D in any order on any of the four facilities.

For TN1654 DS1 converter boards, facility A must be installed first, then B, then C or D. This is required because the primary facility can only reside on facilities A or B.

Passes Far-End Clock

The field is **y** when the DS1 facility is used as a clock reference for the receive fiber signal.

This field appears on the Fiber-Link screen only for TN574 DS1 converter circuit packs. On the TN1654 DS1 converter board, none of the facilities can be used as a clock reference for the receive fiber signal, and administration of this field is not applicable.

DS1 facilities cannot be used as system synchronization sources.

Digital Data Compatible

The Digital Data Compatible field is **y** when the DS1 facility is digital data compatible and suitable for carrying packet traffic.

This field appears on the Fiber-link screen only for TN574 DS1 converter circuit packs. The TN574 circuit pack allows any of the four facilities to be used as the primary facility that carries the packet traffic. The TN1654 DS1 converter board allows packet traffic only on facilities A and B, and administration of this field is not applicable.

Bit Rate

This field is used to select domestic T1 operation or international E1 operation for all facilities in the TN1654 DS1 converter complex. The field is set to 1.544 Mbps for T1 operation and 2.048 Mbps for E1 operation.

This field appears on the fiber-link screen only for TN1654 DS1 converter circuit packs.

> **NOTE:**
> The TN1654 DS1 converter circuit pack is also field configurable for T1 or E1 operation. All four DS1 facilities are configured to either T1 or E1 as a group via an option switch located on the component side of the circuit pack. An error will be logged and an alarm will be raised if there is a T1/E1 inconsistency between the administered bit rate and the board option switch setting.

Idle Code

This field is used to set the idle code for all facilities on the TN1654 DS1 converter board. This field can accept any combination of ones (1) and zeros (0) with the exception that the second left-most digit must be set to one (1) at all times.

This field appears on the fiber-link screen only for TN1654 DS1 converter circuit packs.

CRC

This field determines if CRC is enabled for every facility on a TN1654 circuit pack. The field is **y** if a cyclic redundancy check (CRC) is to be performed on transmissions that the board receives.

CRC only applies to E1 operation and appears on the Fiber-link screen only for TN1654 DS1 converter circuit packs with a bit rate of 2.048 Mbps.

DS1 Converter-1 and DS1 Converter-2 Line Compensation

The DS1 facility line signal is pre-equalized at the transmitter on the DS1 converter circuit pack so that DS1 line pulses have correct amplitude and shape when they reach the Network Interface (see Figure 51, DS1 Facility Connections, on page 832). The amount of equalization necessary is determined by the distance to the Network Interface, and also by the type of wiring used to connect to the Network Interface. If the equalization is not set to the correct value, potentially high error rates (errored seconds) will be observed on the DS1 facility. Equalization values are determined as follows:

	Distance to Network Interface (feet)	
Equalizer Setting	**Cable type 22 AWG ABAM & 24 AWG PDS**	**Cable type 26 AWG PDS**
1	1 to 133	0 to 90
2	133 to 266	90 to 180
3	266 to 399	180 to 270
4	399 to 533	270 to 360
5	533 to 655	360 to 450

Line compensation is applicable only to T1 operation, thus these fields will not appear on the fiber-link screen if the TN1654 DS1 converter is administered for a bit rate of 2.048 Mbps.

Line Coding

This field is used to administer the line coding for the DS1 facility. For the TN574 board and the TN1654 board in T1 mode, the field may be set to *ami-zcs* or *b8zs*. If the TN1654 board is set for E1 operation, the line coding may be set to either *ami-basic* or *hdb3*. The line coding must be the same at each end of the DS1 converter complex.

Framing Mode

Either *esf* or *d4* framing mode can be selected for the DS1 facility. The same framing mode must be used at each end of the DS1 converter complex.

For TN574 DS1 converter boards, the `Framing Mode` field is administrable.

For TN1654 DS1 converter boards, this field is display only. It cannot be administered. The TN1654 has option switches located on the component side of the circuit pack. If T1 operation is selected via the first switch, four additional switches are used to select the framing mode for each facility. Each facility can be set to either D4 or ESF framing. The `Framing Mode` field will display what the switch is set to for the DS1 facility.

Framing Mode is applicable only to T1 operation, thus this field will not appear on the fiber-link screen if the TN1654 DS1 converter is administered for a bit rate of 2.048 Mbps.

Line Termination

This field displays the line termination for the DS1 facility on the TN1654 DS1 Converter circuit pack. This field is display only. It cannot be administered. The TN1654 has option switches located on the component side of the circuit pack. If E1 operation is selected via the first switch, four additional switches are used to select the line termination for each facility. Each facility can be set to either CEPT 75 ohm coaxial or 120 ohm CEPT twisted pair. This line termination field will display what the switch is set to for the DS1 facility.

Line Termination is applicable only to E1 operation, thus this field will not appear on the fiber-link screen if the TN1654 DS1 converter is administered for a bit rate of 1.544 Mbps

Facility Circuit ID

These fields are used to specify a unique alpha-numeric name up to 40 characters long for each DS1 facility. This field will be displayed for each facility whose *Facility Installed?* field is set to **yes**.

DS1 Converter Performance Measurements Report

The DS1 Converter Performance Measurements provide link performance measurements for the DS1 facilities.

When no facility alarms exist on the DS1 facility, events that indicate a degradation in the performance of the DS1 facility are monitored and recorded. These events will generate alarms when performance of the DS1 facility has degraded below acceptable levels. These measurements include errored seconds, bursty seconds, severely errored seconds, and failed seconds.

There are two DS1 Converter Performance Measurements Sub-reports. The first sub-report, DS1 Converter Performance Measurements Summary Report, provides information about the worst 15-minute interval of data, the total for 24 hours of data and the current 15-minute counter for each of the previously mentioned counters.

The second sub-report, DS1 Converter Performance Measurements Detailed Report displays a detailed log for the last 96 15-minute intervals for each of the previously mentioned counters.

The DS1 Converter Performance Measurements Summary Report can be accessed with **list measurements ds1-facility summary *UUCSSf* [print | schedule]**. A more detailed version of the report is accessed with **list measurements ds1-facility log *UUCSSf* [print | schedule]**.

The user can reset every hardware- and software-measurement counter for a given facility with **clear measurements ds1-facility *UUCSSf***. The *Counted Since* time is also reset and the *Number of Valid Intervals* count is set to zero.

The reports are printed on the screen or, by using the *print* option, on a printer attached to the terminal.

Clearing Firmware Errors

DS1 converter error reports are generated by firmware autonomously. DS1 converter error reports are not associated with technician-demanded tests. The **test board clear** command does not affect the error status known by the DS1 converter firmware. To clear every on-board firmware-detected error unconditionally, use **clear firmware-counters**.

Error Log Entries and Test to Clear Values

Table 347: DS1 Facility Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	SAT Test to Clear Value
0[1]	0	Any	Any	Any	**test ds1-facility** *UUCSSf* **sh r 1**
1 (a)		Failure Audit #949	MAJOR	ON	**test board** *UUCSS* **sh r 1**
18 (b)	0	**busyout ds1-facility** *UUCSSf*	WARNING	OFF	**release ds1-facility** *UUCSS*
257 (c)		Failure Audit #949	MINOR	ON	**test board** *UUCSS* **sh r 1**
513 (d)	1	Failure Audit #949	MINOR	OFF	**test board** *UUCSS* **sh r 1**
513 (d)	2	Failure Audit #949	MINOR	OFF	**test board** *UUCSS* **sh r 1**
856 (e)		DS1 Facility Query for Slips/Misframes #972	MINOR	OFF	**none**
1025 (f)		Failure Audit #949	MAJOR[2]	OFF	**test board** *UUCSS* **sh r 1**
1281 (g)	None	Failure Audit #949	MAJOR[2]	OFF	**test board** *UUCSS* **sh r 1**
1281 (g)	1	Failure Audit #949	MAJOR[2]	OFF	**test board** *UUCSS* **sh r 1**
1281 (g)	2	Failure Audit #949	MAJOR[2]	OFF	**test board** *UUCSS* **sh r 1**
1537 (h)		Failure Audit #949	MAJOR[2]	OFF	**test board** *UUCSS* **sh r 1**
1793 (i)		Failure Audit #949	MAJOR[2]	OFF	**test board** *UUCSS* **sh r 1**
2065 (j)		DS1 Facility Query for Slips/Misframes #972	MINOR	OFF	**none**
2305 (k)		Failure Audit #949	MAJOR	OFF	**test board** *UUCSS* **sh r 1**
2561 (l)		Failure Audit #949	MINOR[3]	OFF	**test board** *UUCSS* **sh r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

2 These failures are logged as a WARNING alarm when the error is first reported. The alarm severity is raised to a MAJOR in 15 minutes if the problem persists.

3 This failure is logged as a WARNING alarm when the error is first reported. The alarm severity is raised to a MINOR in 15 minutes if the problem persists.

Notes:

When problems persist, use **reset board** to reset the DS1 converter circuit pack. This may temporarily resolve the error condition and restore service until further assistance is provided.

a A major failure occurred on the DS1 interface hardware on the DS1 converter circuit pack associated with this DS1 facility. Replace the DS1 converter circuit pack.

b This error indicates that the DS1 facility has been busied out via the **busyout ds1-facility** command. To resolve this error, release the DS1 facility via the **release ds1-facility** command.

c A minor failure occurred on the DS1 interface hardware on the DS1 converter circuit pack associated with this DS1 facility. Replace the DS1 converter circuit pack.

d DS1 converter circuit packs in this DS1 converter complex do not match in their framing formats or line coding formats.

Aux Data 1 indicates that the framing formats (ESF or D4) do not match. For TN574 DS1 converter boards, the framing mode is administered on the fiber-link screen. The TN1654 DS1 converter has option switches located on the component side of the circuit pack. If T1 operation is selected via the first switch, four additional switches are used to select the framing mode for each facility. The `Framing Mode` field on the fiber-link screen is display-only for the TN1654 boards. It displays what the switch is set to for the DS1 facility. It cannot be administered.

Aux Data 2 indicates that the line coding formats do not match. Line Coding is an administrable value on the fiber-link screen. The line coding options are *ami-zcs* or *b8zs* for TN574 boards and TN1654 boards in T1 mode. For TN1654 boards in E1 mode, the line coding options are *ami-basic* or *hdb3*.

This error should clear in 15 minutes.

1. Verify that DS1 facility and the network is using the same line coding (ami-zcs, b8zs, ami-basic, hdb3) and framing mode (ESF, D4). Use **list fiber-link** and **display fiber-link** commands to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network.

   If the framing mode format differs on boards in a TN1654 DS1 converter complex, the DS1 converter board that has its option switch set incorrectly will have to be physically removed from the system in order to set the facility framing mode switch properly.
2. If the problem persists, reset both DS1 converter circuit packs via the **reset board** command.
3. If the problem still persists, replace this DS1 converter circuit pack.
4. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

e More than 88 negative and/or positive slip errors occurred. This error will clear when there are no slips for 1 hour.

1. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
2. Verify that the DS1 facility and the network are using the same Line Coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. Use **list fiber-link** and **display fiber-link** to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network. See the previous sections, “Line Coding” and “Framing Mode” for details on how these options apply to the TN574 and TN1654 DS1 converter boards.

3 For TN574 boards and TN1654 boards in T1 mode, check line equalization settings as described in the previous section, “DS1 converter-1 and DS1 converter-2 Line Compensation.”

4 Enter **display errors** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **display errors** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.

5 If the problem still persists, replace this DS1 converter circuit pack.

6 If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

f Loss of Frame Alignment (LFA) Alarm, the RED alarm: This alarm indicates that the DS1 interface associated with the DS1 facility cannot frame up on the received data.

For the following repair procedure, see to Figure 51, DS1 Facility Connections, on page 832 and the diagrams in the related test descriptions.

1 If the network is used instead of private T1 lines, check that the DS1 facility and the network are using the same line coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. For TN1654 boards, verify that the two boards in the DS1 converter complex are using the same bit rate. Use **list fiber-link** and **display fiber-link** to check the values for this DS1 facility. Contact T1 Network Service to verify the modes set for the network. See the previous sections, “Line Coding”, “Framing Mode”, and “Bit Rate” for details on how these options apply to the TN574 and TN1654 DS1 converter boards.

2 Run the Near-End External Loopback test (#799) via the **test ds1-facility *UUCSSf* external-loopback** command by setting up a loop back at CPE side of CSU towards DS1 converter circuit pack shown as loop back point **LB 1** in the test description diagram. If the test fails, replace connectors and the cables between CSU and the DS1 converter circuit pack.

3 If the test passes, run the Near-End External Loopback test (#799) via the **test ds1-facility *UUCSSf* external-loopback** command by setting up a loop back at DS1 facility side of CSU towards the DS1 converter circuit pack shown as loop-back point **LB 2** in the test description diagram. If the test fails, replace the CSU.

4 If Test #799 passes, run the Far-End Internal Loopback test (#797) via the **test ds1-facility *UUCSSf* long** command. If Test #797 passes, go to step 6. If the test fails, then run the Near-End External Loopback test (#799) via the **test ds1-facility UUCSSf external-loopback** command at the other end of the DS1 converter complex, and repeat steps 2 and 3 for the other endpoint.

If this is not a critical-reliability system and if there is only one DS1 facility, then Test #799 can only be executed at the end that is closer to the media server relative to the DS1 converter circuit pack at the end of the DS1 converter complex. If the test cannot be executed for this reason, then replace the cables, connectors and the CSU at the other end of the DS1 converter complex.

5 If the problem could not be isolated by the near-end external loop-back tests, then the fault should be between CSU A and CSU B. Contact T1 Network Service to resolve the problem(*).

6 If the problem still persists, check for excessive slips and synchronization problems. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, or SNC-BD errors. For TN574 boards and TN1654 boards in T1 mode, check line equalization settings as described in the previous section, *“DS1 Converter-1 and DS1 Converter-2 Line Compensation”*.

7 Enter **display errors** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **display errors** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.

8 If the problem still persists, replace this DS1 converter circuit pack.

9 If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

If D4 framing mode is used, an in-band alarm signal (RFA) will be transmitted that will corrupt the transmit data on this facility.

g *Aux Data None* This entry in the DS1 Facility Error Log will only occur prior to Release V5. The DS1 converter circuit pack's neighbor (the DS1 converter circuit pack at the other end of the DS1 converter complex) is unable to frame up on the signal being sent to it by this DS1 converter circuit pack on this DS1 facility. The far-end facility will be in LFA state. To isolate faults for this case, follow the repair procedure for Error Type #1025 for the other end of the DS1 facility. Note that references to the near and far ends are reversed, for example, the neighbor is now the near end. If D4 framing is used, received data will be corrupted as well as transmitted data.

Aux Data 1 indicates that the facility is detecting a Remote Frame Alarm (RFA), also known as the YELLOW alarm, being sent by the remote DS1 endpoint. This Yellow alarm corresponds to the yellow F2 state documented in CCITT Recommendation I.431. If D4 framing is used, received data will be corrupted in addition to transmitted data.

Aux Data 2 indicates that the facility is detecting a yellow F5 state alarm. This error only applies to TN1654 DS1 converter boards in 32-channel E1 operation with CRC enabled via the fiber-link screen. The F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431.

The far-end facility will be in LFA state. To isolate faults for this case, follow the same repair procedure as in Error Type #1025 (loss of frame alignment) for the other end of the DS1 facility.

h Alarm Indication Signal (AIS), the BLUE alarm. This alarm indicates that the far end of the facility is out of service. This means that the other end of the DS1 facility is undergoing maintenance testing or has a LOS condition and the CSU is providing a **Keep Alive** signal. If the **Keep Alive** signal is not supplied by the CSU, a LOS condition will exist on the facility instead of the AIS. If a LOS condition exists on the facility, the green LED on the TN574 DS1 converter circuit pack that is associated with the facility will be off; if an AIS condition exists on the facility, the green LED that is associated with the facility that has the AIS will be on. For TN1654 DS1 converter boards, the LED associated with the facility will be lit red if either the LOS or AIS conditions exist.

To isolate faults for this case, follow the same repair procedure as in Error Type #1793 (loss of signal) for the other end of this DS1 facility.

An RFA alarm indication (YELLOW alarm) is transmitted in response to this BLUE alarm. If D4 framing is used, transmitted data is corrupted.

i Loss of Signal (LOS) alarm. This alarm indicates that no signal is present at the DS1 interface associated with the facility. On TN574 DS1 converter boards, the green LED that is associated with the facility will be off. For TN1654 DS1 converter boards, the LED that is associated with the facility will be lit red. If the LED behavior differs, replace the DS1 converter circuit pack.

Fault isolation for this problem may be different depending on the capabilities of the CSU device that is being used. Typically, CSUs provides an LED that is useful for fault isolation (see Figure 52, Typical CSU Maintenance Capabilities, on page 833). This is the "16 Zeros" LED. This LED is momentarily lit when a string of 16 consecutive zeros is detected in the DS1 signal from the DS1 converter. Zeros on a DS1 link are represented by an absence of a pulse. Thus, an active 16 Zeros LED indicates a LOS alarm from the DS1 converter.

For the following repair procedure, see <Link>Figure 51 on page 832 and the diagrams in the related test descriptions.

1. If the DS1 facility side LOS indication on CSU A is off (inactive), check for a problem between the DS1 converter A circuit pack and the CPE side of CSU A. Connectors, cables, and the CSU may need to be replaced.
2. If the DS1 facility side LOS indication on CSU A is on (active), check for a problem between the CSU A and the CSU B. Contact T1 Network Service to resolve the problem.[1]
3. If the CPE side LOS indication on CSU B is on (active), check for a problem between the CPE side of CSU B and the DS1 converter B circuit pack. Connectors, cables, and the CSU B may need to be replaced.
4. If the CSU A and the CSU B do not provide visual CPE side and DS1 facility side LOS indications, follow the repair procedure that is given for Error Type1025 (loss of frame alignment). Apply the procedure first to the DS1 converter B side instead of the DS1 converter A where the error is reported (external loop-back test is not expected to pass if we execute it at this end as long as we have the LOS indication).

   Repair procedure for Error Type #1025 (loss of frame alignment) includes execution of the Near-End External Loopback test (#799). If this is not a critical-reliability system and if there is only one DS1 facility, then Test #799 can only be executed at the end that is closer to the media server relative to the DS1 converter circuit pack at the end of the DS1 converter complex. If the test cannot be executed for that reason, then still make the external loop back as if the test was going to be executed, but instead of executing the test, check the green LED at the face plate of the DS1 converter B that is associated with this DS1 facility. If the green LED is off, then replace the connectors, cables, and the CSU B.
5. If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.
6. If the problem still persists, replace this DS1 converter circuit pack.

If D4 framing is used, an in-band alarm signal (RFA) is transmitted that corrupts transmit data in response to this alarm.

j More than 17 misframe errors occurred. This error will clear when there are no misframes for 1 hour.

1. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, or SNC-BD errors.
2. Verify that the DS1 facility and the network are using the same Line Coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. Use **list fiber-link** and **display fiber-link** commands to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network. See the previous sections, "''Line Coding'' and ''Framing Mode'' for details on how these options apply to the TN574 and TN1654 DS1 converter boards.
3. For TN574 boards and TN1654 boards in T1 mode, check line equalization settings as described in the previous section *"DS1 Converter-1 and DS1 Converter-2 Line Compensation"*.

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1 DS1 facility may be a private line or it may be connected to the Network. Network Interface (NI) point is where the customer's maintenance responsibility ends and the DS1 facility vendor's maintenance responsibility begins. This point ideally is the T, R, T1, and R1 terminals on the rear of the CSU to which the wires of the DS1 facility vendor's DS1 facility is attached. If the NI does not occur at this point, then any cabling between the CSU terminals and the NI is also considered to be part of the CPE. This cable typically runs between the DS1 facility terminals of the CSU and a cross-connect field where the DS1 facility vendor has terminated the DS1 facility. Maintenance responsibility for this portion of the DS1 facility resides with the customer unless other arrangements are made.

4 Enter **display errors** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **display errors** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.

5 If the problem still persists, replace this DS1 converter circuit pack.

6 If the problem still persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

k Facility Packet Channel Loopback Error. This error indicates that the DS1 converter primary facility that carries the packet time slots and DS1 control channel is looped to itself. This error applies only to facilities A and B on TN1654 DS1 converter boards. If both facilities A and B are being used and firmware detects a loop-back condition an attempt will be made to switch the primary facility to the other facility. If the other facility is looped, down or not being used, the PN will be down until this loop back is removed.

1 Check the loop-back LEDs on both CSU A and CSU B as shown in Figure 51, DS1 Facility Connections, on page 832 to see if a CSU is in a loop-back mode. Also check to see if the CSUs have been manually hard-wired into a loop-back mode. Remove detected loop backs.

2 If the CSUs are not in loop-back mode, reset both DS1 converter boards via the **reset board** command.

l Facility Jitter Alarm. This alarm indicates excessive receive jitter on the DS1 facility. This error only applies to TN1654 DS1 converter boards. The problem is external to the DS1 converter board. It could be caused by bad wiring, a bad device (CSU or repeater) or a bad signal coming in at the Network Interface.

Figure 51: DS1 Facility Connections

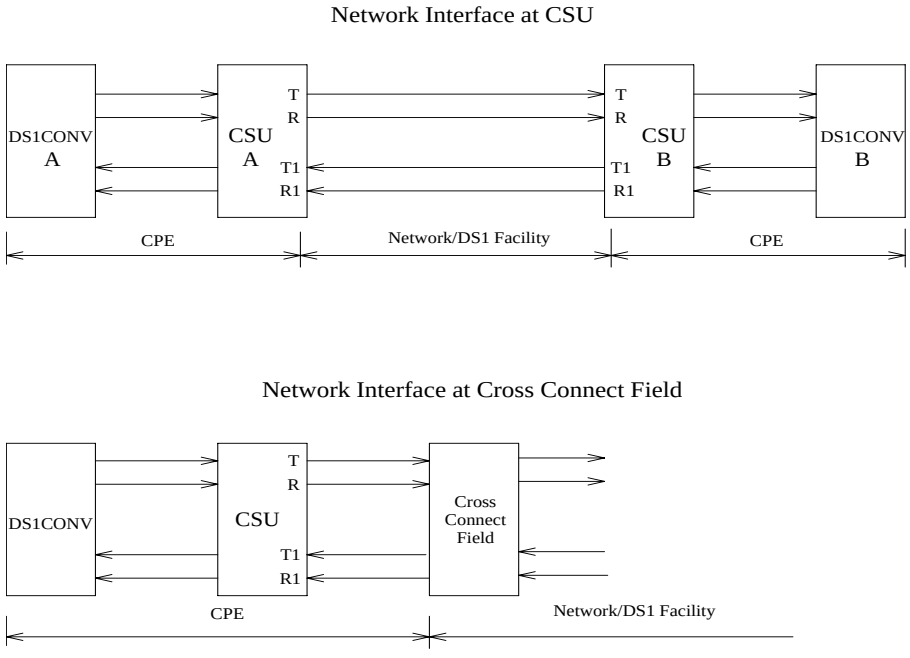
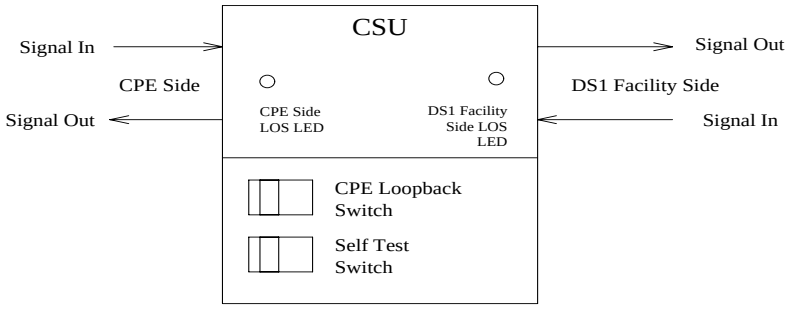


Figure 52: Typical CSU Maintenance Capabilities



System Technician-Demanded Tests: Descriptions And Error Codes

Always investigate tests in the order presented in the following table. By clearing error codes associated with the Failure Audit, for example, you may also clear errors generated from other tests in the testing sequence. The Failure Audit test is executed via the test board command

Order of Investigation	Short Test Sequence	Long Test Sequence	External Loopback	Reset Sequence	D/ND[1]
Failure Audit (#949)					ND
DS1 Interface Options Audit (#798)	X	X			ND
Far-End Internal Loopback test (#797)		X			D
Near-End External Loopback test (#799)			X		D

1 D = Destructive; ND = Nondestructive

Far-End Internal Loop-Back Test (#797)

This test is **destructive**.

This test starts at the DS1 converter circuit pack whose equipment location was entered and traverses over the specified facility and loops at the internal facility interface on the other DS1 converter circuit pack in the DS1 converter complex. See the following diagram.

Every part of this test is executed under firmware control and the result is sent back to the maintenance software. The test is executed by sending digital data through every DS1 channel on this facility. For TN574 DS1 Converter facilities, test patterns are sent through every DS1 channel. For TN1654 DS1 Converter facilities, test patterns are sent through one DS1 channel.

If there is only one DS1 facility available, the system will not allow that last facility to be busied out. In that case, the DS1 converter circuit pack must be busied out before executing this test.

For a standard-, duplex-, or high-reliability system (no PNC duplication), if there is only one DS1 facility available, then this test can only be executed at the endpoint that is closer to the media server relative to the neighbor DS1 converter circuit pack because of its impacts on the system control links. For TN574

DS1 converter boards, the completion of the test will be delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication) or for a system with multiple DS1 facilities, the test can be executed at any DS1 converter circuit pack.

If the test passes on a TN1654 DS1 facility, the *round trip delay time* will be displayed in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent.

Figure 53: Far-End Internal Loop-Back Test (#797)

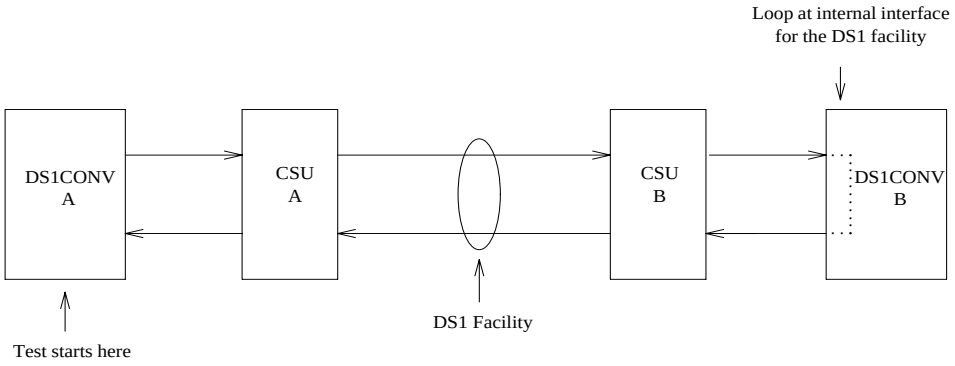


Table 348: Test #797 Far-End Internal Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Use **add fiber-link** to administer the DS1 converter.
2321	ABORT	DS1 facility is not busied out. Use **busyout ds1-facility** to busyout the DS1 facility. If there is only one DS1 facility, use **busyout board** to busyout the DS1 converter circuit pack.
2332	ABORT	For this system configuration, test is not allowed to execute at the far end when there is only one DS1 facility available. Execute the test at the other end of the DS1 converter complex.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 348: Test #797 Far-End Internal Loop-Back Test

Error Code	Test Result	Description / Recommendation
	FAIL	Far-End Internal loop back failed. A problem exists between DS1 converter A and DS1 converter B's internal interface for the DS1 facility (see previous diagram). **1** If the test is executed as a part of an error analysis, then return back to the related section. **2** Enter **display errors** and follow the associated repair procedures for any on-board DS1C-BD errors on this DS1 converter circuit pack and the DS1 converter circuit pack at the other end of the DS1 converter complex. **3** If the network is used instead of private T1 lines, verify that the DS1 facility and the network are using the same Line Coding. For TN574 boards and TN1654 boards in T1 mode, also verify that the Framing Mode used is the same. Use **list fiber-link** and **display fiber-link** to check the values for this DS1 facility. Contact T1 Network Service to check the modes used by the network. See the previous sections, "Line Coding" and "Framing Mode" for details on how these options apply to the TN574 and TN1654 DS1 converter boards. **4** Isolate the problem by running the Near-End External Loopback test (#799) via **test ds1-facility *UUCSSf* external-loopback**, first at this end and then at the other end of the DS1 converter complex. Setup loop backs at different points as shown in the description diagram for Test #799, and follow repair procedures described for Test #799. **5** If the problem could not be found by near-end external loop-back tests, then the fault should be between the CSU A and the CSU B. Contact T1 Network Service to resolve the problem, also see the repair procedures for Error Type #1025 (loss of frame alignment).
Any	PASS	Transmission through the path of the loop back is successful. TN1654 DS1 facilities will display the round trip delay time in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent.

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DS1 Interface Options Audit Test (#798)

This test is nondestructive.

This test sends the administered DS1 Interface options to the DS1 converter circuit pack. Options are sent to both DS1 converter circuit packs at the same time to prevent any transitional mismatch of options.

The following DS1 facility options are sent to the TN574 DS1 converter circuit pack: Framing Mode, Line Coding and DS1 converter-1 and DS1 converter-2 Line Compensation.

The following DS1 facility options are sent to the TN1654 DS1 converter circuit pack: Line Coding and DS1 converter-1 and DS1 converter-2 Line Compensation (T1 only). These option fields appear on the Fiber-link Administration screen.

Table 349: Test #798 DS1 Interface Options Audit

Error Code	Test Result	Description / Recommendation
105	ABORT	The neighbor DS1 converter circuit pack at the other end of the DS1 converter complex is not accessible.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Use **add fiber-link** to administer the DS1 converter fiber link.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	The DS1 Interface options are sent to the circuit pack.

Near-End External Loop-Back Test (#799)

This test is **destructive**.

This test starts at the DS1 converter circuit pack whose equipment location was entered and traverses over the specified facility and loops back at the manually hard-wired external loop-back device. Depending on the type of physical connectivity of the DS1 facility, special tools, cables or connectors may be required to make the hard-wired loop backs.

To isolate a problem, set the loop back first at the loop-back point **LB 1**, and then at the loop-back point **LB 2**, see Figure 54 and Figure 51. Place the loop backs at as many points as your CSU capabilities will allow. Hard-wired loop backs at the far end are not desirable, because the equalization-level adjustments may cause problems.

Every part of this test is executed under firmware control and the result is sent back to the maintenance software. The test is executed by sending digital data through every DS1 channel on this DS1 facility.

This test is executed via the **test ds1-facility *UUCSSf* external-loopback** command. It is not part of the long test sequence because it requires modifications to the physical connectivity of the DS1 facility.

If there is only one DS1 facility available, system will not allow the last facility to be busied out. In that case, the DS1 converter circuit pack must be busied out before executing this test.

For a standard-, duplex-, or high-reliability system (no PNC duplication), if there is only one DS1 facility available, then this test can only be executed at the endpoint that is closer to the media server relative to the neighbor DS1 converter circuit pack because of its impacts on the system control links. For a critical-reliability system (PNC duplication) or for a system with multiple DS1 facilities, the test can be executed at any DS1 converter circuit pack.

If the test passes on a TN1654 DS1 facility, the *round trip delay time* will be displayed in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent. This measurement is taken on the last DS1 channel tested.

Figure 54: Loopback Points for Test #799

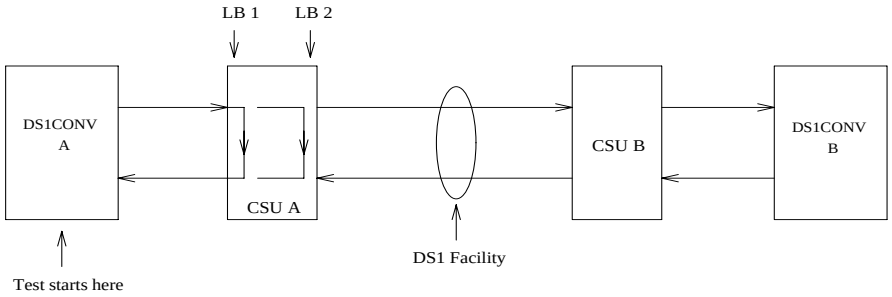

Table 350: Test #799 Near-End External Loop-Back Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Use **add fiber-link** to administer the DS1 converter fiber link.
2321	ABORT	DS1 facility is not busied out. Busyout the DS1 facility via **busyout ds1-facility**. If there is only one DS1 facility, busyout the DS1 converter circuit pack via **busyout board**.
2332	ABORT	With this system configuration, test is not allowed to execute at the far end when there is only one DS1 facility available. Check the green LED at the face plate of the DS1 converter circuit pack. The green LED should be on if the loop is complete.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

Table 350: Test #799 Near-End External Loop-Back Test

Error Code	Test Result	Description / Recommendation
	FAIL	Near-end external loop back failed. A problem exists in the path of the loop back. **1** If the test is executed as a part of an error analysis, then return back to the related section. **2** Enter **display errors** and follow the associated repair procedures for any on-board DS1C-BD errors. **3** If the loop-back point is **LB 1**, replace connectors and cables between the DS1 converter A and the CSU A. If the loop-back point is **LB 2**, replace CSU A. Also see the repair procedure for Error Type #1025 (loss of frame alignment). **4** If the test still fails, replace DS1 converter A circuit pack.
Any	PASS	Transmission through the path of the loop back is successful. TN1654 DS1 facilities will display the round trip delay time in milliseconds in the `Error Code` field. The round trip delay time is defined as the length of time in milliseconds it takes for the firmware to receive the test pattern after it has been sent. This measurement is taken on the last DS1 channel tested.

Failure Audit (#949)

This test is nondestructive.

This test queries the DS1 converter circuit pack for any existing circuit pack or facility failures and any unacknowledged cleared failure messages. Upon receiving the query request, DS1 converter firmware sends failure reports to the maintenance software for every error in its failure database.

This test operates on both MOs DS1C-BD and DS1-FAC. Error counts of both MOs (DS1C-BD and DS1-FAC) that are displayed in the error log will be incremented when this test is executed. This test is executed via the **test board** command. The test is also executed internally by the maintenance software when an alarm is resolved

Table 351: Test #949 Failure Audit

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Use **add fiber-link** to administer the DS1 converter fiber link.

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Table 351: Test #949 Failure Audit *Continued*

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	The DS1 converter circuit pack reported failures or retransmitted a cleared failure message. **1** Enter **display errors** and follow the associated repair procedures for any DS1C-BD and DS1-FAC errors.
	PASS	The DS1 converter circuit pack has no failures.

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DS1C-BD

S8700 MC only

Also called DS1 Converter

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DS1C-BD	MAJOR	**test board *location* sh r 1**	DS1 converter circuit pack
DS1C-BD	MINOR	**test board *location* sh r 1**	DS1 converter circuit pack
DS1C-BD	WARNING	**test board *location* sh r 1**	DS1 converter circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The DS1 converter complex is part of the port-network connectivity (PNC) consisting of two TN574 DS1 Converter or two TN1654 DS1 Converter circuit packs connected by one to four DS1 facilities. It is used to extend the range of the 32-Mbps fiber links that connect PNs to the Center Stage Switch, allowing PNs to be located at remote sites.

The TN1654 DS1 Converter Circuit pack is a redesign of the TN574 DS1 Converter board. The TN1654 provides functionality equivalent to the TN574 but also adds a 32-channel E1 interface for international support as well as circuit-switched wideband connections (NxDS0). The TN1654 is supported beginning with DEFINITY Release 5r.

Every error condition reported by the firmware is associated with background tests that the firmware runs autonomously. Demand tests that are executed by the maintenance software do not cause any new error generation by the firmware. However, Failure Audit test (#949) affects auditing of the software error log by forcing the firmware to report the pending errors again.

Maintenance of the DS1 facilities themselves is covered under the "DS1-FAC" MO.

The DS1 converter complex can extend a fiber link between two EIs or between a PN EI and an SNI. Fiber links between two SNIs or between a PN and the Center Stage Switch (CSS) cannot be extended.

The TN1654 board is not compatible with the TN574 board. A DS1 converter complex may consist of two TN574 boards or two TN1654 boards, but a TN574 cannot be combined with a TN1654 in the same complex. A system with multiple DS1 converter-remoted PNs may contain DS1 converter complexes of both types, TN1654 board-pairs and TN574 board-pairs. Critical-reliability configurations with a pair of DS1 converter complexes serving an PN require identical board pairs and facilities. For example, a TN574 complex and a TN1654 complex may not be used together to serve the same PN in a critical-reliability configuration.

DS1 converter circuit packs connect to TN570 Expansion Interface (EI) circuit packs and TN573 Switch Node Interface (SNI) circuit packs via metallic cables as shown in Figure 55, DS1 converter connection to EIs and SNIs, on page 841. A fiber link cable can be used instead of the metallic cable if it is necessary to locate the DS1 converter far from the connected EI or SNI circuit pack, for example, in an adjacent cabinet.

The DS1 converter circuit pack can be placed in any regular slot in a PN carrier. However, the DS1 converter circuit pack can only be placed in slots 1 and 21 in a Switch Node (SN) carrier. The DS1 converter circuit pack is not connected to the TDM bus or the SN backplane. Communication to the circuit pack is done through the connected EI or the SNI circuit packs. Therefore, there is considerable interaction between the DS1 converters and the connected EIs and the SNIs. A special “Y” cable connects the DS1 converter circuit pack to the Fiber Endpoint and to the facilities.

NOTE:
The two DS1 converter boards, TN1654 and TN574, use unique “Y” cables that are incompatible with each other.

The TN573 SNI circuit pack is incompatible with the TN1654 board. A TN573B (or higher-suffixed) SNI board must be used when connecting to a TN1654 board. The TN573B SNI board is fully backward compatible with the TN573 board and can be connected to either TN1654 or TN574 boards.

NOTE:
A TN573B (or higher-suffixed) board must be used when connecting a SNI board to a TN1654 board. Error 125 will be logged and an on-board minor alarm will be generated against the SNI board if it is incompatible with the TN1654 circuit pack.

Figure 56, DS1 converter Complex in Direct Connect PNC, on page 842 and Figure 57, DS1 Converter Complex in Duplicated PNC with 1 SN, on page 843 show DS1 converter connections in a direct-connect PNC configuration and between the CSS and an PN in a critical-reliability system configuration (duplicated PNC).

Figure 55: DS1 converter connection to EIs and SNIs

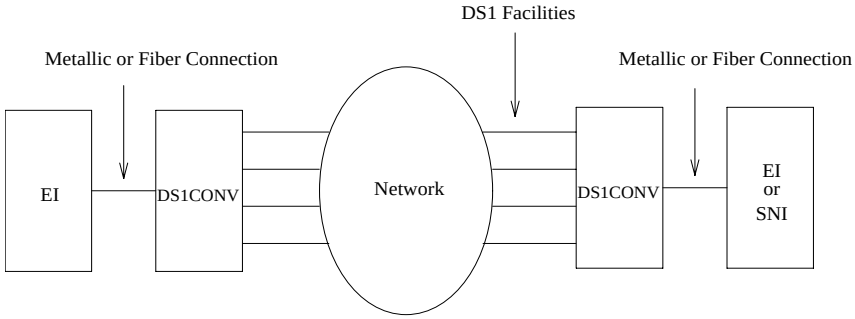


Figure 56: DS1 converter Complex in Direct Connect PNC

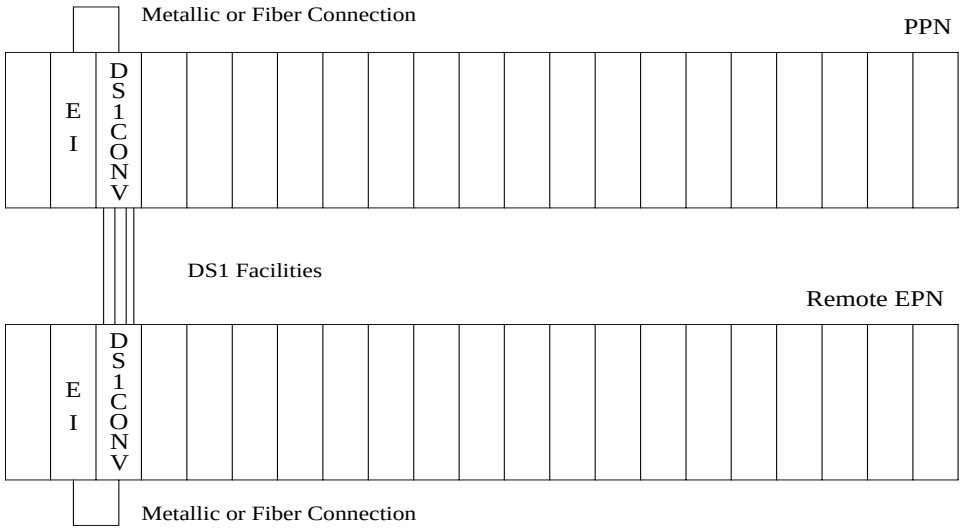
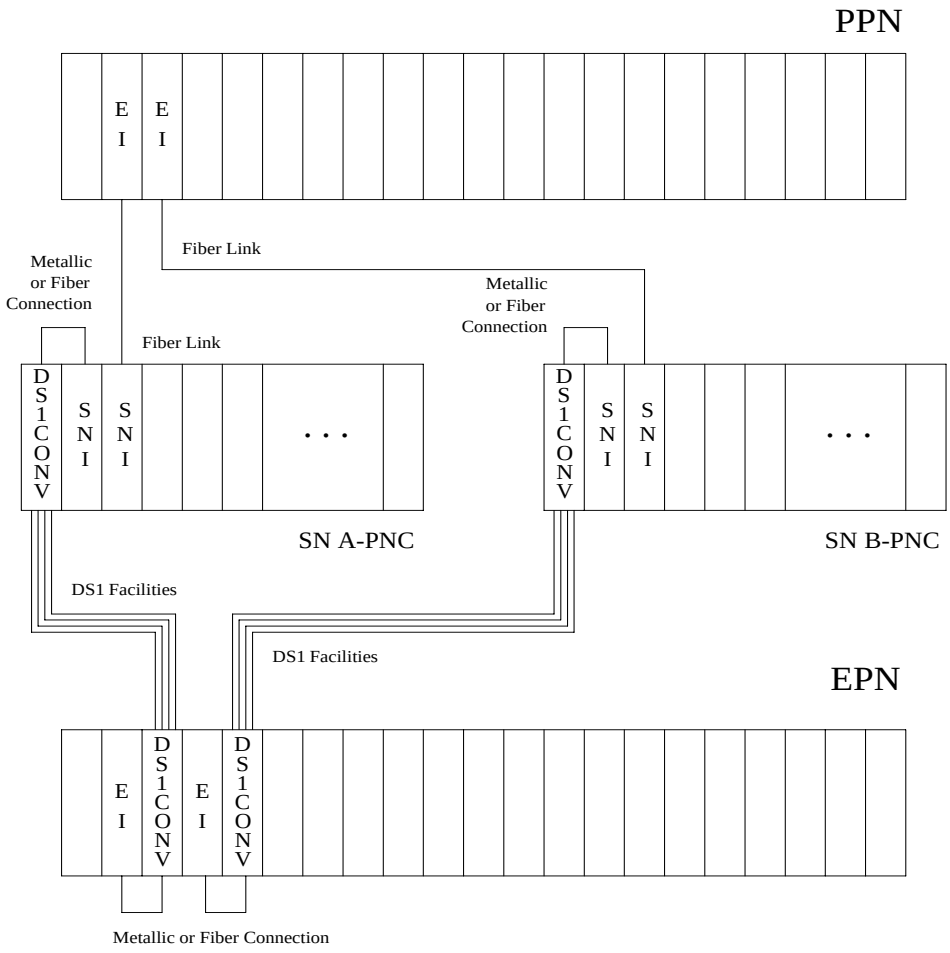


Figure 57: DS1 Converter Complex in Duplicated PNC with 1 SN



DS1 Converter Administration and Board Insertion

Board insertion is the detection of a circuit pack by the system. The DS1 converter circuit pack will not be inserted unless the circuit pack type, TN574 or TN1654, is entered into the associated field in circuit pack administration screen. The Fiber Endpoint (the EI or the SNI) must also be inserted and be operational for the DS1 converter circuit pack to function.

Fiber link administration must be completed before the DS1 converter maintenance can be operational. Fiber links are administered via the **add fiber-link** command. Fiber Endpoints, DS1 converter circuit pack locations and DS1 facility options are entered as a part of the fiber link administration.

Administration steps for a standard-, duplex-, or high-reliability system (no PNC duplication) are as follows:

1. Administer carriers via the **add/change cabinet** command.
2. Administer circuit packs via the **change circuit-pack** command.

3 Administer connectivity and the facility options of the DS1 converter complex via the **add/change fiber-link** command.

Administration steps for a critical-reliability system (PNC duplication) are as follows:

1 Enable PNC duplication feature using the **change system-parameter customer-option** command.

2 Administer carriers via the **add/change cabinet** command.

3 Administer circuit packs via the **change circuit-pack** command.

4 Administer connectivity and the DS1 facility options of each DS1 converter complex via the **add/change fiber-link** command.

5 Turn on PNC duplication via the **change system-parameter duplication** command.

TN1654 Board Configuration Switch Settings

The TN1654 DS1 converter circuit pack is field configurable for T1 or E1 operation so that a single board serves worldwide application. All four DS1 facilities are configured to either T1 or E1 as a group via an option switch located on the component side of the circuit pack. If T1 operation is selected, four additional switches are used to select the framing mode for each facility. Each facility can be set to either D4 or ESF framing. If E1 operation is selected, the same four switches are used to select the E1 facility line termination impedance. The E1 line termination impedance for each facility can be set to either 120Ω for twisted-pair or 75Ω for coaxial wiring.

T1 or E1 operation must also be administered for the TN1654 DS1 converter board on the fiber-link screen via the `Bit Rate` field. An error will be logged and an alarm will be raised if there is a T1/E1 inconsistency between the administered bit rate and the board option switch setting.

The T1 facility framing mode and the E1 facility line termination impedance are defined by the option switch settings only. Administration of these values is not allowed. The fiber-link screen will display the selected option switch settings for each facility.

DS1 Converter LEDs

The TN574 board has seven LEDs on its faceplate. The TN1654 board has eleven LEDs on its faceplate. The top three system standard LEDs are used to provide an indication of the state of the DS1 converter board. These LEDs are under firmware control until the board has established a link to the media server via the EI or SNI. Once the link is established, software controls the three LEDs. If the link breaks, the LEDs are again under firmware control.

The red and green LEDs have the traditional use where red means an alarm condition and green indicates that maintenance testing is in progress. The red and green LED is also turned on during circuit pack initialization by firmware. When the control link to the circuit pack is lost, firmware controls the red LED to indicate an alarm condition.

The amber LED under firmware control is used to indicate the state of the:

- Physical fiber interface
- Fiber channel (link to EI or SNI)
- DS1 control channel (link to opposite DS1 converter board)
- Server communications link

in the following manner and descending order of priority. (The amber LED stays lit longer as the DS1 converter complex approaches full operation.)

1. If the fiber is out of frame or is in a loss-of-signal condition, the amber LED will flicker at a 5-Hz rate (on for 0.1 second, off for 0.1 second).
2. If the fiber channel is down (DS1 Converter circuit pack/fiber endpoint communications), the amber LED will flash at a 1-Hz rate (on for ½ second, off for ½ second).
3. If the DS1 control channel is down between the two DS1 converters in the DS1 converter complex, the amber LED will pulse at a 1/2-Hz rate (on for 1 second, off for 1 second).
4. If the media server communications link is down, the amber LED will wink off every 2 seconds for 200 msec (2 seconds on, 0.2 second off).
5. If all is well with the Fiber Interface and every communications channel, the amber LED will remain on continuously in a standard-, duplex-, or high-reliability system. In a critical-reliability system (duplicated PNC):
   - An active DS1 converter circuit pack's amber LED remains on continuously.
   - A standby DS1 converter circuit pack's amber LED remains off.

   The LED will then be under software control.

The bottom four green LEDs on the TN574 DS1 converter board are under hardware control. The four green LEDs indicate, for each DS1 converter facility, whether a receive signal is present for the DS1 facility.

The next four LEDs on the TN1654 DS1 converter board are labeled STATUS LEDs and are for future use. These LEDs will not be lit.

The bottom four LEDs on the TN1654 board are labeled SPAN LEDs. These LEDs are under firmware control. If the facility is not administered, then the LED is not lit. The LED is lit amber if the facility is running alarm free. If the facility is detecting either a red alarm (loss-of-signal or loss-of-frame), a yellow alarm (remote frame alarm) or a blue alarm (AIS signal) then the LED is lit red. The SPAN SELECT Switch on the TN1654 faceplate is for future use. Pushing the switch will have no affect on the board.

Clear Firmware-Counters Command

DS1 converter firmware generates error reports autonomously. This takes place independently of technician-demanded tests. The **test board *UUCSS*** clear command will not affect the error status reported by firmware. The **clear firmware-counters** command clears every on-board firmware-detected error unconditionally.

The **clear firmware-counters *UUCSS*** command sends a downlink message to the DS1 converter circuit packs, causing them to clear out their firmware error counters and failure databases. Once the firmware failure database is cleared, the failure audit test (#949) will pass. If problems still exist, the firmware will increment its error counters and the failure audit test will begin failing again.

This command should not be used as a replacement for the repair procedures associated with the hardware error log entries. This command may be useful if a problem has been fixed and off-board alarms associated with the problem are still active.

Downtime Required when Upgrading to TN1654 DS1 Converter Circuit Packs

WARNING:
Upgrading from TN574 DS1 converter circuit packs to TN1654 DS1 converter circuit packs will require down time for the affected PN.

The TN1654 DS1 Converter circuit pack is not compatible with the TN573 SNI circuit pack, the TN574 DS1 converter board, the Y-cable used to connect to the TN574 DS1 converter board or pre-G3V5 software. All DS1 converter boards and Y-cables must be upgraded. If the PN is remoted via a Center-Stage Switch, the connected SNI must also be upgraded. A TN573B (or higher-suffixed) SNI board must be used when connecting to a TN1654 DS1 converter board.

The fiber-link administration for the TN574 DS1 converter complex must be removed via the remove fiber-link command. The Change Circuit-Pack screen must be updated to reflect that TN1654 boards are now being used. The TN1654 DS1 converter complex can then be administered via the add fiber-link command.

Replacing a DS1 Converter Circuit Pack with the Same Type DS1 Converter Circuit Pack — Unduplicated PNC

WARNING:
Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:
Replacing a Switch Node Interface, Switch Node Clock, Expansion Interface or DS1 Converter circuit pack on an unduplicated system disrupts service. The service effect can range from outage of a single PN to outage of the entire system.

WARNING:
A DS1 Converter complex must consist of two TN574 boards or two TN1654 boards. A TN574 cannot be combined with a TN1654 in the same DS1 converter complex.

Steps	Comments
Enter **busyout board** UUCSS.	UUCSS represents the cabinet-carrier-slot address of the circuit pack to be replaced. A G3-MT logged in at the PN's Maintenance circuit pack remains active, despite the busyout.
Replace the circuit pack with the same DS1 converter board type.	
Wait for the circuit pack to reset.	Red and green LEDs will light and then go out.

Steps	Comments
Enter **release board** UUCSS	**CAUTION:** *Do not busyout any Expansion Interface circuit packs after this point.*
Enter **test alarms long clear** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, FIBER-LK, AND DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc**.	

Replacing a DS1 Converter Circuit Pack with the Same Type DS1 Converter Circuit Pack—Duplicated PNC

WARNING:

On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WARNING alarm against TDM-CLK with Error Type #2305. Repairs to standby PNC in this state may disrupt service. Otherwise, if the active PNC is functional, replacement of a standby component will not disrupt service.

Steps	Comments
Enter **status pnc**.	Verify that the component to be replaced is on the standby PNC.
Enter **busyout pnc**.	
Enter **busyout board** UUCSS.	UUCSS represents the cabinet-carrier-slot address of the circuit pack to be replaced.
Replace the circuit pack with the same DS1 converter board type.	
Enter **release board** UUCSS.	**CAUTION:** *Do not busyout any Expansion Interface circuit pack after this point.*
Enter **test alarms long clear** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C-BD alarms to clear, or enter **clear firmware-counters** <**a-pnc** or **b-pnc**>.	Use the letter designation of the pnc that holds the replaced component (the standby pnc).
Enter **status pnc**.	If either PNC's state of health is not "functional", consult the PNC-DUP section of the Maintenance Manual.
Enter **release pnc**.	

WARNING:

Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:

Replacing a Switch Node Interface, Switch Node Clock, Expansion Interface or DS1 Converter circuit pack on an unduplicated system disrupts service. The service effect can range from outage of a single PN to outage of the entire system.

WARNING:

A DS1 Converter complex must consist of two TN574 boards or two TN1654 boards. A TN574 cannot be combined with a TN1654 in the same DS1 converter complex.

WARNING:

The two DS1 converter boards, TN1654 and TN574, use unique “Y” cables that are incompatible with each other.

WARNING:

A TN573B (or higher-suffixed) board must be used when connecting a SNI board to a TN1654 DS1 Converter board.

Steps	Comments
Enter **list fiber-link**	Determine the fiber-link number associated with the two TN574 circuit packs to be upgraded.
Enter **busyout fiber-link *fiber#***	***Fiber#*** represents the fiber-link number associated with the TN574 DS1 converter complex that is being upgraded to a TN1654 DS1 converter complex.
Enter **remove fiber-link *fiber#***	
Remove the TN574 DS1 converter circuit packs from the system.	
Replace the TN574 Y-cables with TN1654 Y-cables.	
Replace the removed TN574 DS1 converter circuit packs with TN1654 DS1 converter circuit packs. Prior to installing the TN1654 boards, review the prior section, *TN1654 Board Configuration Switch Settings*.	
If a TN1654 DS1 converter board is connected to an SNI board, upgrade the SNI to a TN573B or greater.	
Wait for the circuit packs to reset	Red and green LEDs will light and then go out.
Enter **change circuit-packs *cabinet #***. Update the screen to show that TN1654 boards are now being used instead of TN574 boards. Also update the connected SNI, if applicable, to suffix B.	***Cabinet #*** represents the cabinet associated with a DS1 converter board. The ***change circuit-packs*** screen needs to be updated for both DS1 converter boards. Also, if needed, re-add translations for connected EI boards.

Steps	Comments
Enter **add fiber-link *fiber#*** to re-add the fiber-link using TN1654 DS1 converter circuit packs.	***Fiber#*** represents the fiber-link number associated with the TN574 DS1 converter complex that is being upgraded to a TN1654 DS1 converter complex
Enter **test alarms long clear** for category **exp-intf**.	
Wait 5 minutes for SNI-BD, FIBER-LK AND DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc**	

Upgrading TN574 DS1 Converter Circuit Packs in a Fiber-Link to TN1654s — Duplicated PNC

WARNING:
Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:
In duplicated PNC configurations, one DS1 converter complex in the fiber-link serves as the active and the second DS1 converter complex serves as the standby. Each DS1 Converter complex consists of two TN574 boards or two TN1654 boards. A TN574 cannot be combined with a TN1654 in the same DS1 converter complex. It is also required that all four DS1 converter boards and interconnecting facilities that serve an PN be of the same type. Note, however, that TN574 and TN1654 boards can coexist within the same system, they just cannot be in the same fiber-link.

WARNING:
The two DS1 converter boards, TN1654 and TN574, use unique “Y” cables that are incompatible with each other.

WARNING:
A TN573B (or higher-suffixed) board must be used when connecting a SNI board to a TN1654 DS1 Converter board.

Table 352: Upgrading TN574 DS1 Converter Circuit Packs in a fiber-link to TN1654s — Duplicated PNC

Steps	Comments
Enter **status pnc.**	Verify that the A-PNC is active. If the B-PNC is active, enter the reset pnc interchange command to cause the A-PNC to go active.
Enter **busyout pnc-standby.**	Fiber link cannot be removed if PNC duplication is operational. Must busyout the standby PNC first.

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Table 352: Upgrading TN574 DS1 Converter Circuit Packs in a fiber-link to TN1654s — Duplicated PNC

Steps	Comments
Enter change system-parameters duplication. Change the `Enable Operation of PNC Duplication` field to **`n`**.	Disable PNC duplication.
Enter **list fiber-link.**	Determine the fiber-link number that the four TN574 circuit packs to be upgraded are associated with.
Enter **busyout fiber-link *fiber#***.	***fiber#*** represents the fiber-link number associated with the TN574 DS1 converter complexes that are being upgraded to TN1654 DS1 converter complexes.
Enter **remove fiber-link *fiber#***.	
Remove the four TN574 DS1 converter circuit packs from the system.	
Replace the TN574 Y-cables with TN1654 Y-cables.	
Replace the removed TN574 DS1 converter circuit packs with TN1654 DS1 converter circuit packs. Prior to installing the TN1654 boards, review the prior section, *TN1654 Board Configuration Switch Settings*.	
If a TN1654 DS1 converter board is connected to an SNI board, upgrade the SNI to a TN573B or greater.	
Wait for the circuit packs to reset.	Red and green LEDs will light and then go out.
Enter **change circuit-packs *cabinet#***. Update the screen to show that TN1654 boards are now being used instead of TN574 boards. Also update the connected SNI, if applicable, to suffix B.	***cabinet#*** represents the cabinet associated with a DS1 converter board. The *change circuit-packs* screen needs to be updated for all four DS1 converter boards. Also, if needed, re-add translations for connected EI boards.
Enter **change system-parameters duplication**. Change the `Enable Operation of PNC Duplication?` field to **`y`**.	Enable PNC duplication.
Enter **add fiber-link *fiber#*** to re-add the fiber-link using TN1654 DS1 converter circuit packs.	***fiber#*** represents the fiber-link number associated with the TN574 DS1 converter complexes that are being upgraded to TN1654 DS1 converter complexes.
Enter **test alarms long clear** for category **exp-intf**.	

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Table 352: Upgrading TN574 DS1 Converter Circuit Packs in a fiber-link to TN1654s — Duplicated PNC

Steps	Comments
Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK and DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc | b-pnc**.	
Enter **status pnc**.	If either PNC's state of health is not "functional", consult the PNC-DUP section of the Maintenance Manual.

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Converting DS1-CONV Complex to Direct-Connect Fiber (duplicated PNC)

NOTE:
The following procedure is generic in its scope. Check the customer's switch configuration for EI/SNI structures.

WARNING:
Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:
In duplicated PNC configurations, one DS1-CONV complex in the fiber-link serves as the active and the second DS1-CONV complex serves as the standby. Each DS1 Converter complex consists of two TN574 or TN1654 circuit packs.

Table 353: Convert from DS1-CONV to direct-connect fiber in a duplicated PNC

Step	Command/Step	Description
1	status pnc	Verify that the A-side is active. • If the B-PNC is active, enter **reset pnc-interchange** and press Enter. • Then verify that the A-side is active (**status pnc**).
2	busyout pnc-standby	Busyout the duplicated switch side.
3	change system-parameters duplication	Disable PNC duplication by changing the `Enable Operation of PNC Duplication?` field to **n**.
4	list fiber-link	Lists administered fiber connections by number. Select the link number associated with the DS1-CONV complex that you are removing.

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Table 353: Convert from DS1-CONV to direct-connect fiber in a duplicated PNC

Step	Command/Step	Description
5	busyout fiber link *n*	Busyout the fiber link of interest. The fiber link number (step 6) is **n** for this command.
6	remove fiber link *n*	Remove the link administration for this link.
7	change circuit-pack *cabinet*	Remove the DS1-CONV administration for the four designated circuit packs (***cabinet*** is the cabinet number where these DS1-CONV complexes reside). Press Enter.
8	Remove the DS1- CONV hardware.	Remove the 4 TN574 or TN1654 DS1-CONV circuit packs and Y-cables. The TN1654 and TN574 DS1-CONV boards use unique "Y" cables that are incompatible with each other. Reuse these cables only with the proper circuit pack.
9	Install fiber-optic cable.	Add the lightwave transceivers (multimode 9823A or single-mode 300A) to match the lightguide fiber. Add these to the EIs and SNIs formerly connected to the DS1 converter circuit packs. Connect the lightwave transceivers with lightguide fiber.
10	Check fiber-optic cable connections.	Ensure that the fiber-optic cables are securely connected to the lightwave transceivers that are attached to the designated circuit packs through the connections behind the cabinet.
11	add fiber-link *n*	Administer the new EI/SNI fiber connection.
12	change system-parameters duplication	Enable PNC duplication by changing the `Enable Operation of PNC Duplication` field to **y**.
13	Enter **test alarms long clear** for category **exp-intf**.	
14	Wait 5 minutes.	SNI-BD, SNI-PEER, FIBER-LK and EXP-INTF MOs need time to clear (or enter **clear firmware-counters *a-pnc*** or ***b-pnc*)**
15	Enter **status pnc**.	If either PNC's state of health is not `functional`, consult the PNC-DUP MO.

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Removing Fiber Connectivity to an PN

This procedure covers removing the connectivity to an PN or between SNs. Removing an PN and its associated carrier and circuit packs can be handled on a board-type basis.

If this system is duplicated, start with step 1; otherwise, start with step 6.

NOTE:
The following procedure is generic in its scope. Check the customer's switch configuration for EI/SNI structures.

WARNING:
Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:
In duplicated PNC configurations, one DS1-CONV complex in the fiber-link serves as the active and the second DS1-CONV complex serves as the standby. Each DS1Converter complex consists of two TN574 or TN1654 circuit packs.

Table 354: Removing Fiber Connectivity from a PN

Step	Command/Step	Description
1	status pnc	Verify that the A-side is active. **a** If the B-PNC is active, enter **reset pnc-interchange** and press Enter. **b** Verify that the A-side is active (**status pnc**).
2	busyout pnc standby	Busyout the duplicated switch side.
3	change system-parameters duplication	Disable PNC duplication by setting the `Enable Operation of PNC Duplication` field to **n**.
4	list fiber-link	List administered fiber connections by number. Record the endpoints (EIs, SNIs, and DS1Cs), and fiber link numbers that you are removing.
5	**busyout fiber-link *n***	Busyout the fiber link of interest. The fiber link number (step 4) is ***n*** for this command.
6	**remove fiber- link *n***	Remove the link administration for this link.
7	change system-parameters duplication	Enable PNC duplication by changing the `Enable Operation of PNC Duplication` field to **y**.
8	Physically remove the a-pnc and b-pnc fiber endpoint circuit packs	Physically remove EI, SNI, and DS1C circuit packs associated with the **b-pnc**.
9	change circuit-pack	Un-administer the PNC circuit packs.
10	clear firmware	Clear any alarms or errors against those circuit packs.
11	status pnc	Use **status pnc** to ensure that the PNC is in good health.

Downgrading from Critical to High Reliability

The strategy this downgrade follows is to change from critical to high reliability. High reliability is actually duplication of the media server, control network, and IPSIs without duplicate paths from IPSIs to CSS.

Table 355: Downgrading from Critical to High Reliability

Step #	Command/Step	Description
1	status pnc	Check to see if A-side is active. If not: **a** Resolve any alarms against **a-pnc**. **b** **reset pnc-interchange** to activate **a-pnc**.
2	busyout pnc-standby	Busyout the standby PNC.
3	change system-parameters duplication	Disable PNC duplication by setting the `Enable Operation of PNC Duplication` field to **n**.
4	list fiber-link	Lists administered fiber connections by number.
5	**change fiber-link *n***	**Change fiber** removes the b-pnc endpoints (EI, DS1Cs, if equipped). ***n*** is the number of the fiber from step 4. Repeat this step for every fiber from step 4.
6	Physically remove the b-pnc endpoint circuit packs	Start with the switch carrier most distant from the media server. Physically remove EI, SNI, and SNC circuit packs associated with the **b-pnc**. Remove fiber cable not used for b-pnc carriers. **See the following CAUTION.**
7	change circuit-packs	Update the translations for the removed circuit packs using the **change circuit-packs** command for the: • Cabinet with b-pnc SN carrier — SNIs — SNCs — EIs and DS1Cs, if any • Cabinet with b-pnc SN carrier — DS1Cs from port carrier • Cabinet with b-pnc EIs in every PN (also DS1Cs, if equipped)
8	change cabinet *UU*	Remove the b-pnc SN carrier.
9	Disable duplication.	Obtain a license file to disable PNC duplication.

CAUTION:
The removal of hardware and fiber cable will interrupt service.

NOTE:
At this point in the downgrade procedure, the system is in unduplicated mode and is operational. The physical removal of the SN carriers may be done at a time that is convenient for the customer. The next step in the downgrade is to follow the normal upgrade procedures from standard to high reliability.

Error Log Entries and Test to Clear Values

Table 356: DS1 Converter Board Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	SAT Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **sh r 1**
1 (a)		Failure Audit test (#949)	MAJOR	ON/OFF	**test board** *UUCSS* **sh r 1**
18 (b)	0	**busyout board** *UCSS*	WARNING	OFF	**release board** *UCSS*
125 (c)	3	None	MINOR	ON	
218 (d)	any	None	MAJOR	ON	
257 (e)		Failure Audit test (#949)	MINOR	ON	**test board** *UUCSS* **sh r 1**
513 (f)	1	Failure Audit test (#949)	MAJOR	ON	**test board** *UUCSS* **sh r 1**
513 (g)	2	Failure Audit test (#949)	MAJOR	ON	**test board** *UUCSS* **sh r 1**
513 (h)	3	Failure Audit test (#949)	MAJOR	ON	**test board** *UUCSS* **sh r 1**
513 (i)	4	Failure Audit test (#949)	MAJOR	ON	**test board** *UUCSS* **sh r 1**
513 (j)	5	Failure Audit test (#949)	MAJOR	ON	**test board** *UUCSS* **sh r 1**
769 (k)	1	Failure Audit test (#949)	MINOR	ON/OFF	**test board** *UUCSS* **sh r 1**
769 (l)	2	Failure Audit test (#949)	MINOR	ON/OFF	**test board** *UUCSS* **sh r 1**
769 (m)	3	Failure Audit test (#949)	MINOR	ON/OFF	**test board** *UUCSS* **sh r 1**
769 (n)	5	Failure Audit test (#949)	MINOR	ON/OFF	**test board** *UUCSS* **sh r 1**
769 (o)	6	Failure Audit test (#949)	MINOR	ON	**test board** *UUCSS* **sh r 1**
769 (p)	7	Failure Audit test (#949)	MINOR	ON	**test board** *UUCSS* **sh r 1**
1281(q)		Failure Audit test (#949)	MINOR	OFF	**test board** *UUCSS* **sh r 1**
1537 (r)		Failure Audit test (#949)	MAJOR	OFF	**test board** *UUCSS* **sh r 1**
1793 (s)		Failure Audit test (#949)	MAJOR	OFF	**test board** *UUCSS* **sh r 1**
2049 (t)		Failure Audit test (#949)	MAJOR	OFF	**test board** *UUCSS* **sh r 1**
3329 (u)		Failure Audit test (#949)	WARNING	OFF	**test board** *UUCSS* **sh r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

Notes:

When problems persist, resetting the DS1 converter circuit pack via the **reset board** command may temporarily resolve the error condition and restore service until further assistance is provided.

a If the alarm is on board, then a major hardware error has occurred in a common part of the circuit pack, not circuit or packet specific. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a major hardware error has occurred in a common part of the circuit pack, or a good clock signal cannot be recovered from the synchronization source. The synchronization source can be the fiber link or any one of the DS1 facilities.

1. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
2. Enter **display errors** and follow the associated repair procedures for any FIBER-LK and DS1-FAC errors.
3. If the problem persists, replace the DS1 converter circuit pack.

b This error indicates that the DS1 converter circuit pack has been busied out via the **busyout board** command. To resolve this error, release the DS1 converter circuit pack via the **release board** command.

c The 24/32-channel option switch setting on the TN1654 circuit pack does not match the administered Bit Rate on the fiber-link screen. If the on-board switch setting is wrong, the circuit pack must be physically removed to change the setting of the board option switch. If the administered bit rate is wrong, use the **change fiber-link** command to correct it.

d The DS1 converter board is physically installed in a slot different than its administered slot. Remove the DS1 converter board and install it in its administered slot or execute the r**emove fiber-link** command followed by the **add fiber-link** command to re-add the fiber-link setting the DS1 converter board's administered location to the physically installed slot.

e A minor hardware error has occurred in a common part of the circuit pack, not circuit or packet specific. Replace the DS1 converter circuit pack.

f A major hardware problem has occurred that affects only circuit data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

g A major hardware problem has occurred that affects only circuit data being transmitted from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

h A major hardware problem has occurred that affects only packet data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

i A major hardware problem has occurred that affects only packet data being transmitted from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

j A major lightwave transceiver transmit error occurred that affects data transmitted from the fiber link to the DS1 facility. Replace the DS1 converter circuit pack.

k *This error only applies to TN574 DS1 converter circuit packs.*

If the alarm is on board, then a minor hardware problem has occurred that affects only circuit data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor hardware problem has occurred that affects only circuit data being received into the DS1 converter circuit pack or a good clock signal cannot be recovered from one of the DS1 facilities.

1. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
2. Enter **display errors** and follow the associated repair procedures for any DS1-FAC errors.
3. If the problem persists, replace the DS1 converter circuit pack.

l *This error only applies to TN574 DS1 converter circuit packs.*

If the alarm is on board, then a minor hardware problem has occurred that affects only circuit data being transmitted from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor hardware problem has occurred that affects only circuit data being transmitted from the DS1 converter circuit pack or a good clock signal cannot be recovered from the fiber channel.

1. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
2. Enter **display errors** and follow the associated repair procedures for any EXP-INTF, SNI-BD, and FIBER-LK errors.
3. If the problem persists, replace the DS1 converter circuit pack.

m *This error only applies to TN574 DS1 converter circuit packs.*

If the alarm is on board, then a minor hardware problem has occurred that affects only packet data being received from the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor hardware problem has occurred that affects only packet data being received from the DS1 converter circuit pack or corrupted packets are being received from the packet facility.

1. Enter **display errors** and follow the associated repair procedures for any EXP-INTF, SNI-BD, and DS1-FAC errors.
2. If the problem persists enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
3. If the problem still persists, replace the DS1 converter circuit pack.

n If the alarm is on board, then a minor FOI transmit error occurred that affects data transmitted from the fiber link to the DS1 facility. Replace the DS1 converter circuit pack.

If the alarm is off board, then either a minor FOI transmit error occurred that affects data transmitted from the fiber link to the DS1 facility. or corrupted packets are being received from the packet facility.

1. Enter **display errors** and follow the associated repair procedures for any EXP-INTF, SNI-BD, and DS1-FAC errors.
2. If the problem persists enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.
3. If the problem still persists, replace the DS1 converter circuit pack.

o A minor FOI receive error occurred that affects data received from the DS1 facility and transmitted to the fiber link. Replace the DS1 converter circuit pack.

p A minor on-board hardware failure exists on the processor/control hardware on the DS1 converter circuit pack. Replace the DS1 converter circuit pack.

q For TN574 DS1 converter boards, this error indicates that the facility masks or the clock reference masks do not match between the two DS1 converter circuit packs in the DS1 converter complex.

For TN1654 DS1 converter boards, this error indicates that the facility masks do not match between the two DS1 converter circuit packs in the DS1 converter complex.

Alarm should clear in 15 minutes.

1. If the problem persists, reset both DS1 converter circuit packs in the DS1 converter complex via the **reset board** command.
2. If the problem persists, replace this DS1 converter circuit pack.
3. If the problem persists, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

r The two TN574 DS1 converter circuit packs in the DS1 converter complex do not have the same firmware vintage. The TN574 DS1 converter with the older vintage should be replaced. This error does not apply to TN1654 boards.

s Fiber Loss of Frame Alignment (LFA) alarm occurred at the other end of the DS1 converter complex. The DS1 converter circuit pack at the other end of the DS1 converter complex cannot frame up on the signal coming into the circuit pack from the fiber. (The neighbor DS1 converter circuit pack detected the LFA and relayed this information to this DS1 converter circuit pack via the DS1 control channel.) The amber LED will flicker at a 5-Hz rate (on for 0.1 second, off for 0.1 second).

1 Execute the **list fiber-link** command to determine the Fiber Endpoint that is connected to the DS1 converter circuit pack. Enter **display errors** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints. Enter **display errors** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.

2 If the problem still persists, check for excessive slips and synchronization problems. Enter **display errors** and follow the associated repair procedures for any SYNC, TDM-CLK, and SNC-BD errors.

3 If the problem still persists, run the Far-End DS1 converter Circuit Pack Loopback test (#788) on this DS1 converter circuit pack via the **test board *UUCSS* long** command. This test will indicate if the neighbor DS1 converter circuit pack hardware is functioning. If this test fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

4 If the problem still persists, run the Far-End Fiber Optic Terminator (lightwave transceiver) Loopback test (#789) on this DS1 converter circuit pack via the **test board *UUCSS* long** command. If this test fails, replace the lightwave transceiver that is connected to the neighbor DS1 converter circuit pack at the other end of the DS1 converter complex. (If the neighbor board is connected to the Fiber Endpoint via metallic cable, then this test will abort.)

5 If the problem still persists, replace connectors and the cable between the neighbor DS1 converter circuit pack and the Fiber Endpoint at the other end of the DS1 converter complex. The cable may be a fiber or a metallic cable.

t Fiber Loss of Signal (LOS) alarm occurred at the other end of the DS1 converter complex. The DS1 converter circuit pack at the other end of the DS1 converter complex does not detect a signal coming into the circuit pack from the fiber. (The neighbor DS1 converter circuit pack detected the LOS and relayed this information to this DS1 converter circuit pack via the DS1 channel.) The amber LED will flicker at a 5-Hz rate (on for 0.1 second, off for 0.1 second).

1 Execute the **list fiber-link** command to determine the Fiber Endpoints that are connected to both ends of this DS1 converter complex. Enter **display errors** and follow the associated repair procedures for any EXP-INTF, and SNI-BD errors for the Fiber Endpoints that are administered on this fiber link, and Enter **display errors** and follow the associated repair procedures for any FIBER-LK errors for this fiber link.

2 If the problem still persists, run the Far-End DS1 converter circuit pack loop-back test (#788) on this DS1 converter circuit pack via the **test board *UUCSS* long** command. This test will show if the neighbor DS1 converter circuit pack hardware is functioning. If this test fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex.

3 If the problem still persists, run the Far-End Fiber Optic Terminator (lightwave transceiver) Loopback test (#789) on this DS1 converter circuit pack via the **test board *UUCSS* long** command. If this test fails, replace the lightwave transceiver that is connected to the neighbor DS1 converter circuit pack. (If the neighbor board is connected to the Fiber Endpoint via metallic cable, then this test will abort.)

4 If the problem persists, replace connectors and the cable between the neighbor DS1 converter circuit pack and the Fiber Endpoint at the other end of the DS1 converter complex. The cable may be fiber or metallic.

u This error indicates that excessive slips have occurred on the fiber link between the DS1 converter board and the Fiber Endpoint. See MO SYNC for diagnosing slip problems.

System Technician-Demanded Tests: Descriptions And Error Codes

Always investigate tests in the order presented in the following table. By clearing error codes associated with the Failure Audit, for example, you may also clear errors generated from other tests in the testing sequence. Tests 788 and 789 are executed by the TN574 DS1 Converter circuit pack only.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Failure Audit (#949)	X	X		ND
DS1 Facilities Connectivity test (#790)		X		D
Far-End DS1 converter circuit pack loop back test (#788) (Executed by TN574 only)		X		D
Far-End Lightwave Transceiver Loopback test (#789) (Executed by TN574 only)		X		D
Board Options Audit (#795)	X	X		ND
Reset test (#787)			X	D

1 D = Destructive; ND = Nondestructive

NOTE:
Test #984 is not an actual demand maintenance test. This test number is used to report results of the **clear firmware-counters** command. Refer to the table for Test #949 to interpret ABORT codes for Test #984.

Reset Test (#787)

This test is **destructive**.

DS1 converter circuit pack is reset via the **reset board** command. When the circuit pack is reset, firmware executes a series of diagnostic tests on the circuit pack. The results of these tests are queried from the board when the board is inserted after completion of the reset sequence. If any of the diagnostic tests fail, the error log will have an entry of Error Type #1 for this circuit pack's location, and the alarm log will have an entry of ON-BOARD MAJOR alarm.

The reset sequence will take about one minute to complete.

Table 357: Test #787 Reset Board

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Use **add fiber-link** to administer the DS1 converter fiber link.
2321	ABORT	DS1 converter circuit pack is not busied out. Use **busyout board** to busyout the DS1 converter circuit pack.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	Reset sequence was executed successfully. (However, this test result does not indicate whether the firmware diagnostic tests passed.) **1** Enter **display errors** to check the error log for any failed diagnostic firmware tests. (This is indicated by an entry of Error Type #1 for this circuit pack's location.) **2** Enter **display alarms** to check the alarm log for any ON-BOARD MAJOR alarms.
0	NO BOARD	The system software found no board. **1** Reset the board. **2** Remotely retry the command.

Far-End DS1 Converter Circuit Pack Loopback Test (#788)

This test is **destructive**.

This test is executed by the TN574 DS1 Converter circuit pack only. See Test #790 for testing for the TN1654 DS1 Converter.

This test starts at the DS1 converter circuit pack whose equipment location was entered, and loops all fiber time slots at the far edge Fiber Optic Interface of the DS1 converter circuit pack at the other end of the DS1 converter complex. See Figure 58.

This test is executed under firmware control, and the result is sent back to the maintenance software. The test is executed by sending digital data through every administered DS1 facility channel. Two different test patterns are used: hexadecimal values 55 and AA.

For a standard-, duplex-, or high-reliability system (no PNC duplication), this test can only be executed at the endpoint that is closer to the media server relative to the neighbor DS1 converter circuit pack, because of its impacts on the system control links, The completion of the test is delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication), test can be executed at any DS1 converter circuit pack.

Figure 58: Far-End DS1 Converter Loop-Back Test (#788)

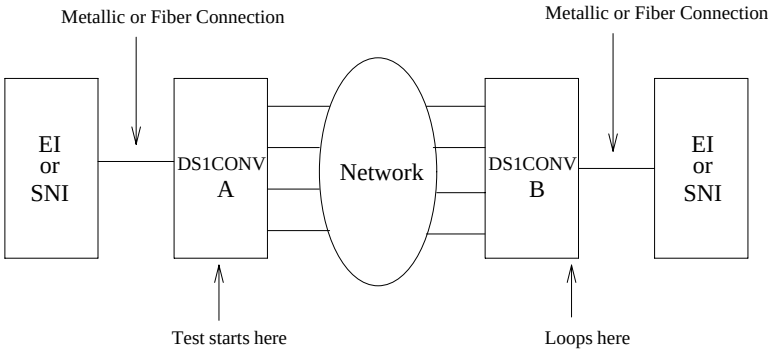

Table 358: Test #788 Far-End DS1 Converter Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent to the selected DS1C board.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Administer the DS1 converter fiber link via the **add fiber-link** command.
2321	ABORT	DS1 converter circuit pack is not busied out. Busyout the DS1 converter circuit pack via the **busyout board** command.
2332	ABORT	With this system configuration (unduplicated PNC), the test was aborted because it cannot be run at the far end when there is only one DS1-FAC available. (The link would be lost, and no test results would be seen at the media server). Run the test at the other end of the DS1C complex.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

Table 358: Test #788 Far-End DS1 Converter Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
	FAIL	Far-end DS1 converter loop back failed. A problem exists between the DS1 converter A and the DS1 converter B (see previous diagram). **1** If there are facilities that are not digital-data compatible, busyout the facilities via the **busyout ds1-facility** command. **2** If the test is executed as a part of an error analysis, then return back to the related section. **3** Enter **display errors** and follow the associated repair procedures for any on-board DS1C-BD errors on this DS1 converter circuit pack and the DS1 converter circuit pack at the other end of the DS1 converter complex. Enter **display errors** and follow the associated repair procedures for any DS1-FAC errors on the DS1 facilities. **4** Check the DS1 Converter Measurements Report to see if there are facilities with excessive errors. Use **list measurements ds1-facility summary**. If there are facilities with excessive errors, execute the Far-End Internal Loopback test (#797) on those facilities, and follow repair procedures described for the test. **5** If the test still fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex. **6** If the test still fails, replace this DS1 converter circuit pack.
	PASS	Transmission through the path of the loop back is successful.
0	NO BOARD	The system software found no board. **1** Reset the board. **2** Remotely retry the command.

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Far-End Lightwave Transceiver Loopback Test (#789)

This test is **destructive**.

This test is executed by the TN574 DS1 Converter circuit pack only. Test #790 covers this testing for the TN1654 DS1 Converter.

This test starts at the DS1 converter circuit pack whose equipment location was entered and loops at the Fiber Optic Terminator (lightwave transceiver) that is connected to the DS1 converter circuit pack at the other end of the DS1 converter complex. See the following diagram.

Every part of this test is executed under firmware control and the result is sent back to the maintenance software. The test is executed by sending digital data through every DS1 facility channel. Two different test patterns are used, these are hexadecimal values 55 and AA.

For a standard-, duplex-, or high-reliability system (no PNC duplication), this test can only be executed at the endpoint that is closer to the media server relative to the neighbor DS1 converter circuit pack because of its impacts on the system control links, also the completion of the test will be delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication), the test can be executed at any DS1 converter circuit pack.

Figure 59: Far-End Lightwave Transceiver Loop-Back Test

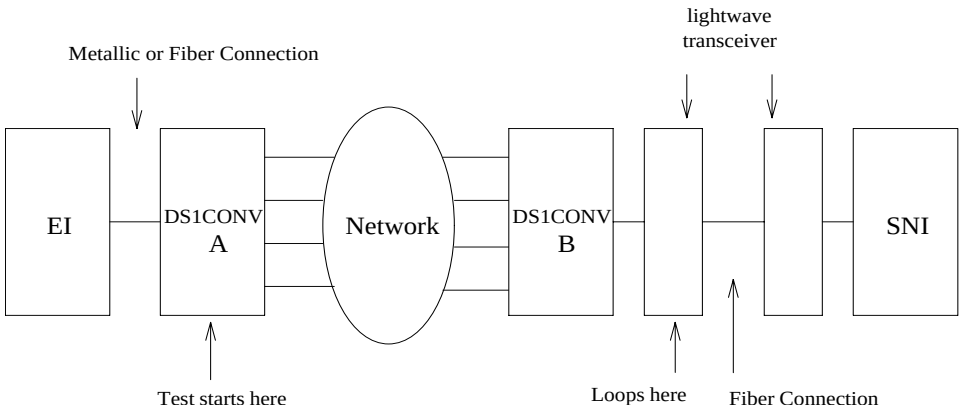

Table 359: Test #789 Far-End FOT (Lightwave Transceiver) Loop-Back Test

Error Code	Test Result	Description / Recommendation
1410	ABORT	The test aborted because no lightwave transceiver is present. The neighbor DS1 converter circuit pack and the fiber endpoint are connected via metallic cable. This abort may be ignored.
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Administer the DS1 converter fiber link via the **add fiber-link** command.
2321	ABORT	DS1 converter circuit pack is not busied out. Busyout the DS1 converter circuit pack via the **busyout board** command.
2332	ABORT	With this system configuration (unduplicated PNC), the test was aborted because it cannot be run at the far end when there is only one DS1-FAC available. (The link would be lost, and no test results would be seen at the media server). Run the test at the other end of the DS1C complex.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 359: Test #789 Far-End FOT (Lightwave Transceiver) Loop-Back Test

Error Code	Test Result	Description / Recommendation
	FAIL	Far-end lightwave transceiver loop back failed. A problem exists between the DS1 converter A and the lightwave transceiver connected to the DS1 converter B (see previous diagram). **1** If there are facilities that are not digital-data compatible, busyout the facilities via the **busyout ds1-facility** command. **2** If the test is executed as a part of an error analysis, then return back to the related section. **3** Enter **display errors** and follow the associated repair procedures for any on-board DS1C-BD errors on this DS1 converter circuit pack and the DS1 converter circuit pack at the other end of the DS1 converter complex. Enter **display errors** and follow the associated repair procedures for any DS1-FAC errors on the DS1 facilities. **4** Check the DS1 Converter Measurements Report to see if there are facilities with excessive errors. Use **list measurements ds1-facility summary**. If there are facilities with excessive errors, execute the Far-End Internal Loopback test (#797) on those facilities, and follow repair procedures described for the test. **5** If the test still fails, replace the lightwave transceiver device that is connected to the DS1 converter circuit pack at the other end of the DS1 converter complex. **6** If the test still fails, replace the DS1 converter circuit pack at the other end of the DS1 converter complex. **7** If the test still fails, replace this DS1 converter circuit pack.
	PASS	Transmission through the path of the loop back is successful.
0	NO BOARD	The system software found no board. **1** Reset the board. **2** Remotely retry the command.

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DS1 Facilities Connectivity Test (#790)

This test is **destructive**.

The DS1 facilities connectivity test will check the correct connectivity of the DS1 facilities at opposite ends of the DS1 converter complex. Every part of this test is executed under firmware control and the result is sent back to the maintenance software.

For TN574 DS1 Converter circuit packs, this test is executed by sending digital data through each time slot of every DS1 facility channel. Two different test patterns are used, these are hexadecimal values 55 and AA.

For TN1654 DS1 Converter circuit packs, this test has been enhanced to provide error codes that point to the exact fault. Rather than simply reporting a failure of the connectivity test, the TN1654 test specifically identifies the two DS1 facilities that are cross-connected at the near and far ends of the DS1

converter complex. In addition, a fault code will indicate the condition of not being able to loop-up the far end, as required to run the test, due to the packet DS1 facility being down.

The TN1654 connectivity test sends digital data through only one time slot. Instead of looping back the facility to itself, the TN1654 version of the test loops-up the other three facilities. If the test pattern comes back, the firmware fails the test due to an incorrect connection between DS1 facilities. It should be noted that this test will pass and give no indication of problems if the non-packet facilities are down.

For a standard-, duplex-, or high-reliability system (no PNC duplication), this test can only be executed at the endpoint that is closer to the media server relative to the neighbor DS1 converter circuit pack because of its impacts on the system control links. In addition, for TN574 DS1 converter boards, the completion of the test will be delayed in this configuration to wait for the recovery of the system control links. For a critical-reliability system (PNC duplication), test can be executed at any DS1 converter circuit pack.

Table 360: Test #790 DS1 Facilities Connectivity Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Use **add fiber-link** to administer the DS1 converter fiber link.
2321	ABORT	DS1 converter circuit pack is not busied out. Use **busyout board** to busyout the DS1 converter circuit pack.
2332	ABORT	With this system configuration (unduplicated PNC), the test was aborted because it cannot be run at the far end when there is only one DS1-FAC available. (The link would be lost, and no test results would be seen at the media server.) Run the test at the other end of the DS1C complex.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 360: Test #790 DS1 Facilities Connectivity Loop-Back Test

Error Code	Test Result	Description / Recommendation
	FAIL	TN574 DS1 facilities connectivity loop-back test failed.
1	FAIL	TN1654 near-end DS1 facility A is connected to far-end DS1 facility B.
2	FAIL	TN1654 near-end DS1 facility A is connected to far-end DS1 facility C.
3	FAIL	TN1654 near-end DS1 facility A is connected to far-end DS1 facility D.
10	FAIL	TN1654 near-end DS1 facility B is connected to far-end DS1 facility A.
12	FAIL	TN1654 near-end DS1 facility B is connected to far-end DS1 facility C.
13	FAIL	TN1654 near-end DS1 facility B is connected to far-end DS1 facility D.
20	FAIL	TN1654 near-end DS1 facility C is connected to far-end DS1 facility A.
21	FAIL	TN1654 near-end DS1 facility C is connected to far-end DS1 facility B.
23	FAIL	TN1654 near-end DS1 facility C is connected to far-end DS1 facility D.
30	FAIL	TN1654 near-end DS1 facility D is connected to far-end DS1 facility A.
31	FAIL	TN1654 near-end DS1 facility D is connected to far-end DS1 facility B.
32	FAIL	TN1654 near-end DS1 facility D is connected to far-end DS1 facility C.
55	FAIL	TN1654 DS1 converter packet facility is down and can't send loop-up message to the far end. **1** Enter **display errors** and follow the associated repair procedures for any DS1-FAC errors on the DS1 facilities at both ends of the DS1 converter complex. If an alarm exists on a DS1 facility, then this test will fail. **2** Check the DS1 connections, both circuit packs should have their DS1 facilities connected identically. **3** Check the DS1 Converter Measurements Report to see if there are facilities with excessive errors. Use **list measurements ds1-facility summary**. If there are facilities with excessive errors, execute the Far-End Internal Loopback test (#797) via **test ds1-facility *UUCSSf* long** on those facilities, and follow repair procedures described for the test. **4** Both circuit packs may not have the same translation information. Run the Board Options Audit test (#795) via **test board *UUCSS* short** for both circuit packs in the DS1 converter complex to send the options. Check the results of this audit test. This test does not pass until the audit test problems are resolved.
	PASS	DS1 facility connections are correct.
0	NO BOARD	The system software found no board. **1** Reset the board. **2** Remotely retry the command.

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Board Options Audit (#795)

This test is **non**destructive.

This test sends the administered circuit pack options to the DS1 converter circuit pack. Options are sent to both DS1 converter circuit packs at the same time to prevent any transitional mismatch of options.

The following data is sent to the TN574 DS1 converter circuit pack:

- system-reliability configuration
- master and slave endpoints for framing (determined by the relative position of the circuit pack to the media server)
- facility mask (whether each facility is installed)
- clock reference mask (whether:
  - each facility can be used as a clock-reference source
  - the board is being used as a network-timing source)
- packet compatible mask (whether each facility is packet compatible)
- facility information for line coding, framing mode, and line compensation

The following data is sent to the TN1654 DS1 converter circuit pack:

- system-reliability configuration
- master and slave endpoints for framing (determined by the relative position of the circuit pack to the media server)
- facility mask (whether each facility is installed)
- idle code
- CRC-enabled/-disabled flag (sent in E1 mode only)
- facility information for line coding and line compensation (sent in T1 mode only).

Failure Audit (#949)

This test is **non**destructive.

This test queries the DS1 converter circuit pack for any existing circuit pack or facility failures and any unacknowledged cleared failure messages for auditing purposes. Upon receiving the query request, DS1 converter firmware sends failure reports to the maintenance software for every error in its failure database.

This test operates on both MOs DS1C-BD and DS1-FAC. Error counts of both MOs (DS1C-BD and DS1-FAC) that are displayed in the error log will be incremented when this test is executed. This test is also executed internally by the maintenance software when an alarm is resolved

Table 361: Test #949 Failure Audit

Error Code	Test Result	Description / Recommendation
2000	ABORT	Timed out while waiting for a response from the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2316	ABORT	Fiber link is not administered. Administer the DS1 converter fiber link via the **add fiber-link** command.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	The DS1 converter circuit pack reported failures or retransmitted a cleared failure message. **1** Enter **display errors** and follow the associated repair procedures for any DS1C-BD and DS1-FAC errors.
	PASS	The DS1 converter circuit pack has no failures.
0	NO BOARD	The system software found no board. **1** Reset the board. **2** Remotely retry the command.

DT-LN-BD (Data Line Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DT-LN-BD	MINOR	**test board *location* sh**	Data Line circuit pack
DT-LN-BD	WARNING	**test board *location* sh**	Data Line circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also "DAT-LINE (Data Line Port)" for related line information.

DTMR-PT (Dual-Tone Multifrequency Receiver Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DTMR-PT	MAJOR	**test port *location* sh**	Dual-Tone Multifrequency Receiver port (TTR)
DTMR-PT	MINOR	**test port *location* sh**	Dual-Tone Multifrequency Receiver port (TTR)
DTMR-PT	WARNING	**release port *location***	Dual-Tone Multifrequency Receiver port (TTR)

1 For information on specifying a ***location***, see Command Syntax on page 179.

Dual-Tone Multifrequency Receiver ports (DTMR), also known as Touch-Tone Receivers (TTRs), reside on the following circuit packs:

- TN748
- TN420
- TN756
- TN744B and TN744C
- TN2182
- TN2312AP

There are four Dual-Tone Multifrequency Receiver (DTMR-PT) ports and two General Purpose Tone Detector (GPTD-PT) ports on the TN748, TN420 and TN756 Tone Detector packs. There are eight GPTD-PT ports on each TN744, TN2182 and TN2312AP circuit packs. The GPTD ports can be used for TTR, call progress tone detection, call prompting, MF signaling, dial tone detection, CO answer detection and OCM call classification. The DTMR port is used to detect touch-tone digits that are placed on the Time Division Multiplex (TDM) bus. Examples of touch-tone digits are digits 0 through 9, digit #, and digit *. The ability of the DTMR port to detect touch-tone digits is essential for maintenance of other circuit packs (for example, IPSI circuit pack) and in placing a station-to-station call. Calls originating from a hybrid station *do not* require a DTMR port.

The DTMR-PT MO implements a set of tests to ensure that detection of touch-tone digits by the DTMR port is functioning properly. For any Tone Detector circuit-level error (DETR-BD), see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

Error Log Entries and Test to Clear Values

Table 362: Dual-Tone Multifrequency Receiver Port (TTR) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 **S8100**: 1 (c)	17664	Tone Detector Audit/ Update test (#43)	MAJOR MINOR (a)	ON	**test port** *UUCSSpp* **r 2**
18	0	**busyout port** *UUCSSpp*	WARNING	ON	**release port** *UUCSSpp*
130 (d)		None	WARNING	ON	**test port** ***UUCSSpp*** **sh r 2**
257 (b)	17666	Tone Detector Audit/ Update test (#43)	MAJOR MINOR (a)	ON	**test port** *UUCSSpp* **r 3**
513 (c) **S8100**: 513	Any	Tone Detection Verification test (#42)	MAJOR MINOR (a)	ON	**test port** *UUCSSpp* **r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

Error Notes:

a There are two possible alarm levels for this error: Major alarm and Minor alarm. A Major alarm is raised if the total number of DTMR ports currently in service is less than or equal to 1/2 of the administered threshold number. Otherwise, a Minor alarm is raised. In either case, run the short test sequence against the DTMR port and follow the error code procedures for the individual tests.

The threshold number of DTMR ports for service is administered using the **change system-parameters maintenance** command.

b The DTMR port lost its translation. Testing the DTMR port is sufficient to reload its translation. If testing the DTMR port does not clear the error, then the IPSI or Tone Detector circuit pack containing the defective DTMR port should be replaced.

c This error indicates the DTMR port is having problems detecting touch-tone digits. If this error is being constantly logged, then the IPSI or Tone Detector circuit pack containing the defective DTMR port should be replaced.

d This error type indicates that the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. By clearing error codes associated with the *Tone Detection Verification* test, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification test (#42)	X	X	ND
Tone Detector Audit/Update test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test checks the touch-tone digits detection capability of the DTMR port.

Table 363: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
	ABORT	The system could not allocate enough resources for this test, or there was an Internal system error.
1	ABORT	The system could not allocate enough resources to test the DTMR port.
1001	ABORT	The system was unable to put the DTMR port in the mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This could happen when the system is heavily loaded. If the system is not heavily loaded, then test the TDM Bus via the **test tdm [a|b]** command. **1** Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a Tone Generator for the test connection. This may be caused by a heavy load on the system or by a faulted Tone-Clock. **S8100** **1** Make sure there is a Tone-Clock circuit pack in the same port network. **2** If a Tone-Clock circuit pack is missing, install one in the same port network. **1** Check to see if there are any alarms against the Tone-Clock in the PN where the test aborted. If so, see the recommended procedures for TONE-BD (Tone-Clock Circuit) on page 1902 or TONE-PT (Tone Generator) on page 1927. **2** If a new Tone-Clock has been inserted, allow about 1 minute for maintenance to run on the newly inserted circuit pack. **3** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test **1** Retry the command at 1-minute intervals up to 5 times.

Table 363: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
2006	ABORT	DTMF detection failed. Make sure that the companding mode administered for the system matches that of the Tone Detector: mu-law for TN748, A-law for TN420.
1-3	FAIL	DTMF digits were not correctly detected. **1** Run the short test sequence: **test port *UUCSSpp* sh r 1**. **2** If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore the system performance to normal, replace the Tone Detector or IPSI circuit pack containing the defective DTMR port.
	PASS	The DTMR port is able to detect every touch-tone digit.

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Tone Detector Audit/Update Test (#43)

The DTMR port is refreshed with all time-slot information, and sanity audit is performed on the DTMR port.

Table 364: Test #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description / Recommendation
None	ABORT	The system was not able to allocate all the resources needed for this test. **1** Wait 1 minute and try again.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Hardware audit failed. **1** Run the short test sequence: **test port *UUCSSpp* sh r 1**. **2** If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore the system performance to normal, replace the Tone Detector or IPSI circuit pack containing the defective DTMR port.
	PASS	The DTMR port has been successfully refreshed with its translation.

E-DIG-BD (Multi Application Platform Board)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
DIG800-BD	MINOR	**test board *location* sh**	MO800DIG-BD
DIG800-BD	WARNING	**test board *location* sh**	MO800DIG-BD

1 For information on specifying a ***location***, see Command Syntax on page 179.

The maintenance strategy for DIG800-BD is the same as the one described for MO-XXX-BD [XXX-BD (Common Port Circuit Pack/Media Module) on page 2086]. Maintenance testing of the common circuit pack is handled by on-board firmware and server-controlled tests. Maintenance software queries the firmware for error and alarm information, status, and test results. The firmware automatically reports error conditions that will result in server-controlled testing.

Board Insertion

The switch makes an additional board query if any of the following circuit packs are inserted:

Circuit Pack	Vintage
TN754	49
TN556	49, 80 or greater
TN800	any

For any of the previous initial board up-links, the switch sends queries requesting additional data from the board for administration purposes, while also telling the board the switch software release and the system type.

For the native mode, the response to the board query downlink messages consists of several CCMS uplink messages that identify the true board code, vintage, suffix, emulation type, and the number of reserved slots it needs.

Hyperactivity

The common circuit pack is considered "hyperactive" if the service dispatcher receives 200 up-link messages from the circuit pack in a 10-second period. Since MAPD has 32 ports, the hyperactivity limit is increased to 500 up-link messages per 10 seconds. An alarm is issued, and the board is taken out of service when the limit reaches 400 or when it hits 500 up-link messages in 10 seconds.

LED Use

The LED Control message 038x requests the Angel to drive the red, yellow, and green LEDs on the face plate of typical port board on or off. On the MAPD, only the red LED is controlled by this message. Yellow and green change requests received from the switch by the MAPD drive LCD behavior rather

than LED behavior. The switch continues to send the same LED control messages to the MAPD that it currently sends to every other port board. The MAPD handles proper interpretation of these messages. You should note that the PC on the MAPD, as well as the switch itself, can control the LEDs and the LCD on the MAPD.

Port Administration

In administration without hardware, the switch allows administration of up to 32 MAPD ports of any port type. If the port type later reported by the board does not match the existing type, the switch assumes the board is a MAPD board with a different configuration and rejects the board. MAPD_DCP_STA and MAPD_ASAI_STA are the only two types of terminals are allowed on a MAPD board. Therefore, while administering ports on MAPD using **add station**, it will allow only the previously mentioned terminals.

NOTE:
See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See DIG-LINE (Digital Line) on page 716 for related line information.

E-DIG-RES (TN800 reserve slot)

S8700 / S8500 / S8100

See ASAI-RES/E-DIG-RES (TN800 reserve slot) on page 350.

E-DIG-STA (Emulated Digital Line)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1] (a) (b)	Full Name of MO
E-DIG-STA	MINOR	**test port *location* l**	Emulated Digital Station
E-DIG-STA	WARNING	**test port *location* sh**	Emulated Digital Station

1 For information on specifying a ***location***, see Command Syntax on page 179.

There are 4 tests in the Emulated Digital Line station maintenance test sequence and only one test path in the test sequence. Once the test sequence begins, every test in the test sequence is executed.

E-DIG-ST maintenance monitors and tests ports on the TN800 MAPD circuit pack and the hardware connected to those ports for lines administered as a digital station. These include stations with an emulated digital voice terminal and stations with an emulated digital voice terminal and a linked data module. Stand-alone data modules and data adaptors in stand-alone mode are not supported by the TN800 circuit pack. Circuit pack maintenance is covered by E-DIG-BD.

Hardware Error Log Entries and Test to Clear Values

Table 365: Digital Line Error Log Entries – E-DIG-STA

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
18 (a)	0	**busyout port** *UUCSSpp*	WARNING	OFF	**rel port** *UUCSSpp*
130 (b)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257 (c)	40971	None			
1537 (d)	40968	None	WARNING	OFF	
1793 (e)		Voice and Control Local Loop test (#13)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 3**
2049 (f)		NPE Crosstalk test (#9)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 3**
2305 (g)	32770	None			
3840 (h)	40965	None			
3841 (i)	41029	None			
2304 (j)		None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major alarms may be downgraded to Warning alarms based on the value used in the **set options** command.

Error Notes:

a Maintenance personnel have busied out the port in question. Make sure that the port is released from busyout by using the **release port *UUCSSpp*** command.

b The circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack.

> **NOTE:**
> **S8100**: Error Types 257 and 1537 not present.

c Problems transmitting to the voice terminal. This problem can be caused by defective wiring that can cause varying degrees of problems on different types of sets. Sets such as the 7410 appear to be more susceptible to wiring problems than others.

d An in-link maintenance error has generated an off-board warning due to some problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move voice terminal to a jack that is closer to the switch (number of feet of wiring between the jack and the switch). If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm is retired after a predetermined amount of time.

e The local loop test failed. Each failure increments the counter by 1 when the local loop test fails. The counter is decremented when the loop test passes. When the counter reaches a threshold of 3, an on-board MINOR alarm is raised.

f The NPE Crosstalk test failed. The counter is incremented by 1 when the NPE Crosstalk test fails. The counter is decremented by 1 when the NPE Crosstalk test passes. When the counter reaches a threshold of 3, an on-board MINOR alarm is raised and the board is taken out of service.

g The station went off-hook while it was in the ready-for-service state. Use the **status station** command to determine the state of the station. The off-hook should have moved the station to ready-for-service. No technician action is necessary.

h No terminal is connected to the Digital Line board. No maintenance action is required.

i The circuit pack's message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack. No action is necessary.

j Internal system error; no action is necessary. The error counters 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, and 16 do not have any significance for this MO.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. By clearing error codes associated with the *Voice and Control Channel Local Loop Around* test (#13), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Voice and Control Channel Local Loop Around test (#13)		X	D
NPE Crosstalk test (#9)		X	ND
Station Lamp Updates test (#16)		X	ND

1 D = Destructive; ND = Nondestructive

Digital Line NPE Crosstalk Test (#9)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain and provides conferencing functions on a per-port basis. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of a port's long test sequence and takes about 20 to 30 seconds to complete. Crosstalk testing occurs on both the primary information channel (voice) and the secondary information channel (data) associated with each digital station port. If this test fails on either channel, the station and the DTDM are taken out of service.

Table 366: Test #9 Digital Line NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1	ABORT	During testing of the primary information channel, system resources may not have been available or the port was busy during the test. **1** Check the port status. **2** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. **3** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
2	ABORT	During testing of DTDM, system resources may not have been available or he port was busy during the test. **1** Check if port is being used. If possible, disconnect by toggling the disconnect button on DTDM. Retry the command after 1 minute. **CAUTION:** This action drops the call in progress.

Table 366: Test #9 Digital Line NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system is under heavy traffic conditions or has time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** Use **display port *UUCSSpp*** to determine the station extension or attendant number of the port. **2** Use **status station** or **status attendant** to determine the service state of the port. **3** If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out.
1020	ABORT	Test disabled by background testing. Use the **status station** command to determine when the station is available for testing.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The Network Processing Element (NPE) of the tested port is transmitting in error. This causes noisy and unreliable connections. Error code 1 = Crosstalk test failed on the primary channel. Error code 2 = Crosstalk test failed on the secondary channel. **1** Replace the circuit pack.

Table 366: Test #9 Digital Line NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	PASS	The port is correctly using its allocated time slots. **1** To ensure that this is not an intermittent problem, repeat this test up to 10 times. **2** If complaints persist, examine the station, connections, and wiring.

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Voice and Control Channel Local Loop Test (#13)

These tests check the information and control channels between the media server and the Digital Line port circuit. The media server sends a message to loop around both the information and control channels for the port. First, the primary information (voice) channel loop-back test sends a digital count from the Tone-Clock circuit pack on the primary information channel time slot and receives the same digital count with a General-Purpose Tone Detector.

While the primary information channel is still looped around, the Control Channel Loop-around test sends four different transparent patterns to the on-board microprocessor, receives them back, and compares them.

The Loop Around test for the secondary information (data) channel is the same as the primary information channel loop around test and is performed only if a DTDM is administered.

Next, a Conference test checks the primary information channel. This is the same test as Conference test (#6).

The four tests generate only one result: Pass, Fail, or Abort. If any test fails or aborts, the test sequence stops.

Table 367: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.

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Table 367: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system is under heavy traffic conditions or it has time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. **1** Use **display port *UUCSSpp*** to determine the station extension or attendant number of the port. **2** Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **3** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Rerun the test at 1-minute intervals up to 5 times.
7	FAIL	Conference test failed on primary channel. In some cases, users may not notice disruption in service. In extreme cases, conferencing feature may not work at all.
14	FAIL	The primary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port.
15	FAIL	The control channel between the Processor and Digital circuit pack is not transmitting properly. User impact may range from noticing nothing to not being able to use the port. This could disrupt other users.
16	FAIL	The secondary voice channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port. **1** Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using the **test board *UUCSSpp*** command. **2** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. **3** If the test still fails, replace the Digital Line circuit pack.

Table 367: Test #13 Voice and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
	PASS	The test passed, and every channel is transmitting properly. **1** To ensure that this is not an intermittent problem, repeat this test up to 10 times. **2** If noisy connections for voice or corrupted data for data transfer persist, examine the station, connections, and wiring.

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Station Lamp Updates Test (#16)

This test lights every lamp on the terminal as specified. The lamp updates will run only if the station is in service. The status of the station is checked and the lamp updates are blocked from taking place if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

Table 368: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1	ABORT	System technician may have busied out the port. **1** Look for Error Type 18 (port busied out) for this port. If this error type is present, then release the port (**release station *extension***) and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	Station may be in ready-for-service or out-of-service state. **1** Use the **status station** command to verify state of station. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port is busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension or attendant number of the port. **2** Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until it is idle before retesting. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **3** Retry the command at 1-minute intervals up to 5 times.

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Table 368: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
1392	ABORT	This is currently a TTI port, and the test cannot execute on it. **1** Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a `t` for the port). **2** If either **list config** or **display port** indicates that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The message to light every station lamp was successfully sent to the port. **1** Observe the station lamps being lit when running the test. If every lamps does not light, the other Digital Line test results may indicate related problems that are causing the unlit lamps. **2** Investigate by using other Digital Line port tests and by examining the station, wiring, and connections.

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EMG-XFER (Emergency Transfer)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
EMG-XFER	MAJOR	**test environment *UU***	Emergency Transfer
EMG-XFER	WARNING	**test environment *UU***	Emergency Transfer

1 ***UU*** is the universal cabinet number as listed in the PORT field of the Alarm or Error Log.

S8100

Emergency Transfer (SCC Cabinets)

The system provides the ability to cut designated analog phones through to CO trunks if the switch cannot provide even minimal phone service. This ability is known as Emergency Transfer. The EMG-XFER MO tracks the control of Emergency Transfer. There is one EMG-XFER MO for the port network. Emergency Transfer can be controlled by the system or can be manually controlled via the Emergency Transfer switch located on the Processor circuit pack. A manual ON position (up) generates a Major alarm. A manual OFF position (down) generates a Warning alarm. Unless a technician is currently working on the system, the switch should be left in the auto position.

Error Log Entries and Test to Clear Values

Table 369: Emergency Transfer Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	test environment sh r 1
1 (a)	0	Emergency Transfer Query (#124)	MAJOR	ON	test environment r 3
257 (b)	0	Emergency Transfer Query (#124)	WARNING	ON	test environment r 3

Notes:

a Error Type: 1 - This error type indicates that the Emergency Transfer switch located on the Processor circuit pack is set to the **manual ON** position (up). When the Emergency Transfer switch is in this position it generates a Major alarm.

b Error Type: 257 - This error type indicates that the Emergency Transfer switch located on the Processor circuit pack is set to the **manual OFF** position (down). When the Emergency Transfer switch is in this position it generates a Warning alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables. By clearing error codes associated with the *Cabinet Query Test*, for example, you may also clear errors generated from other tests in the testing sequence. For example, you may also clear errors generated from other tests in the testing sequence.

Single Carrier System

Table 370: Emergency Transfer System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Cabinet Query Test (#122) (a)	X	X	ND
Emergency Transfer Query Test (#124)	X	X	ND
External Alarm Lead Query Test (#120) (b)	X	X	ND
Analog Ring Generator Initialization Test (#117) (c)	X	X	ND
Analog Ring Generator Query Test (#118) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a Refer to CABINET (Cabinet Sensors) on page 564 for a description of this test.

b Refer to EXT-DEV ADMIN? Y (External Device Alarm) on page 972 for a description of this test.

c Refer to RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

Emergency Transfer Query Test (#124)

This test queries the hardware for the state of the Emergency Transfer switch and reports the result. If the switch is in a position where the system software can control Emergency Transfer, then the test passes. If the switch is in a position where the system software cannot control Emergency Transfer, then the test fails. The Processor controls Emergency Transfer. The system software does not have control of Emergency Transfer within a cabinet if the switch is in the manual ON or manual OFF state.

Table 371: TEST #124 Emergency Transfer Query Test

Error Code	Test Result	Description/Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier. Resolve all CABINET alarms. Then, repeat the test.
2029	ABORT	Internal system error **1** Retry the command at 1-minute intervals a maximum of 5 times.
1	FAIL	Emergency Transfer is manually turned OFF via the Emergency Transfer switch. **1** Place the switch in the AUTO position.
2	FAIL	Emergency Transfer is manually turned ON via the Emergency Transfer switch. **1** Place the switch in the AUTO position.
	PASS	The system software has control of Emergency Transfer. If Emergency Transfer is invoked, then there can be a Major alarm in the system that is invoking Emergency Transfer. Table 372, Test #124 Error Log Entries That Cause Emergency Transfer, on page 887 lists the error types and MOs that may cause Emergency Transfer. If any or all of these errors appear in the log, then refer to the appropriate Maintenance documentation and resolve those problems first. If none of these errors appear in the log, then check the Emergency Transfer hardware.

Table 372: Test #124 Error Log Entries That Cause Emergency Transfer

MO Name	Error Type	Aux Data
SW-CTL	1	
SW-CTL	2	
TONE-BD	1	0
TONE-BD	2305	0

S8700 / S8500

The Emergency Transfer MO monitors the position of the Emergency Transfer switch(es) on the EPNs' Maintenance circuit packs. It does not monitor whether the system is actually in Emergency Transfer.

Emergency Transfer (ET) provides the ability to connect designated analog phones to CO trunks when the switch cannot provide minimal phone service. Each EPN's cabinet has its own ET capability, and there is one EMG-XFER MO for each cabinet or stack of single-carrier cabinets.

ET is controlled either automatically by the system, or manually, depending on the setting of the ET switches as described in the following section.

Emergency Transfer Status

The **status cabinet *UU*** command shows the location of the ET switches and the current status of ET in the designated cabinet as follows:

auto+	ET is invoked and under system control.
auto-	ET is not in effect and is under system control (normal operating state).
unavailable	The switch setting(s) is not available.

Error Log Entries and Test to Clear Values

Table 373: EMG-XFER Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test environment** *UU*
1	0	Emergency Transfer query (#124)	MAJOR	ON	**test environment** *UU* **r 3**
257	0	Emergency Transfer query (#124)	WARNING	ON	**test environment** *UU* **r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

System Technician-Demanded Tests: Descriptions and Error Codes (Multicarrier)

Always investigate tests in the order presented in the following table. For example, by clearing error codes associated with the Battery and Battery Charger Query test (#5), you may also clear errors generated from other tests in the testing sequence.

Table 374: System Technician-Demanded Tests: EMG-XFER (Multicarrier Cabinets)

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery & Battery Charger Query test (#5) (a)	X	X	ND
AC Power Query test (#78) (b)	X	X	ND
OLS Query test (Carrier E) (#127) (c)	X	X	ND
OLS Query test (Carrier D) (#127) (c)	X	X	ND
OLS Query test (Carrier A) (#127) (c)	X	X	ND
OLS Query test (Carrier B) (#127) (c)	X	X	ND
OLS Query test (Carrier C) (#127) (c)	X	X	ND
Emergency Transfer Query test (#124)	X	X	ND
Cabinet Sensors Query test (#122) (d)	X	X	ND
External Alarm Lead Query test (#120) (e)	X	X	ND
Analog Ring Generator Initialization test			
Analog Ring Generator Initialization test (#117) (f)	X	X	ND
Analog Ring Generator Query test (#118) (f)	X	X	ND

1 D = Destructive, ND = Nondestructive

Notes:

a See POWER on page 1493 for a description of this test.

b See AC-POWER on page 183 for a description of this test.

c See CARR-POW (Carrier Power Supply) on page 578 for a description of this test.

d See CABINET (Cabinet Sensors) on page 564 for a description of this test.

e See EXT-DEV ADMIN? Y (External Device Alarm) on page 972 section for a description of this test.

f See RING-GEN (Analog Ring Generator) on page 1587 section for a description of this test. These tests show up in the test sequence only if there is a TN768 or TN780 Tone-Clock circuit pack in the EPN being tested.

System Technician-Demanded Tests: Descriptions and Error Codes (Single-Carrier)

Always investigate tests in the order presented in the following table. For example, by clearing error codes associated with the *Power Query* test (#79), you may also clear errors generated from other tests in the testing sequence.

Single-Carrier System

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Power Query test (#79) (a)	X	X	ND
Emergency Transfer Query test (#124)	X	X	ND
External Alarm Lead Query test (#120) (b)	X	X	ND
Analog Ring Generator Initialization test (#117) (c)	X	X	ND
Analog Ring Generator Query test (#118) (c)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a See DC-POWER (Single-Carrier Cabinet Environment) on page 679 for a description of this test.

b See EXT-DEV ADMIN? Y (External Device Alarm) on page 972 for a description of this test.

c See RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

NOTE:
These tests only show up in the test sequence if there is a TN768 Tone-Clock Board in the EPN being tested.

Emergency Transfer Query Test (#124)

The Emergency Transfer Query test queries the hardware for the state of the Emergency Transfer switch and reports the result. If the position of the switch in a PN cabinet is such that the system software can control Emergency Transfer (auto), then the test passes. If the position of the switch or switches is such that the system software cannot control Emergency Transfer (manual “on” or manual “off”), then the test fails. Maintenance Tone-Clock controls Emergency Transfer.

Table 375: Test #124 Emergency Transfer Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to ABORT with Error Code 2000, check for system powering problems with the PN’s A carrier. Resolve every AC-POWER and CARR-POW alarm in a multicarrier cabinet system or DC-POWER alarm in a single-carrier cabinet system. Then, repeat the test. **3** If the test continues to ABORT with a 2000 Error Code, resolve every or MAINT (Maintenance circuit pack) error in a PN. Then, repeat the test.

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Table 375: Test #124 Emergency Transfer Query Test

Error Code	Test Result	Description / Recommendation
2029, 2319, 2320, 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
17, 18, 20, 33, 65, 289	FAIL	Emergency Transfer is manually turned OFF (Emergency Transfer switch off). **1** Place the switch in the AUTO position.
34, 290	FAIL	Emergency Transfer is manually turned ON (Emergency Transfer switch on). **1** Place the switch in the AUTO position.
	PASS	System software has control of Emergency Transfer within this cabinet. If Emergency Transfer is currently invoked (the emergency transfer LED is on), the cause could be a major alarm. **1** The following list shows the error types that can cause Emergency Transfer. If any of these errors appear in the log, then see TONE-BD (Tone-Clock Circuit) on page 1902, and resolve these error types first: • Error Type 3585, Aux Data 121 • Error Type 2305, Aux Data 40800 **2** If none of the previous errors appear in the log, then check the Emergency Transfer hardware. **3** On an EPN, if Emergency Transfer is invoked while call processing is permitted, verify that the current limiter card (982LS) is in the correct slot on the backplane. If the current limiter card is not in the correct slot, move it to the correct location, and rerun Test #124.

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EPN-SNTY (PN Sanity Audit)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
EPN-SNTY	None	None	EPN Sanity Audit

The EPN Sanity Audit feature enhances the system's ability to recover from failure conditions that disable an entire PN. In such situations, not only is the affected PN unable to provide service to the system, but the system itself has not detected the condition. The EPN Sanity Audit feature recognizes a PN as unable to provide service when the software cannot receive control messages from PN circuit packs. When such a failure is detected by the EPN Sanity Audit, a sequence of recovery actions is triggered to restore the PN to service.

For a standard-reliability system (unduplicated server), the recovery sequence is:

1. TDM bus switch
2. EPN WARM reset
3. EPN COLD reset

The recovery sequence is:

1. TDM bus switch
2. Tone-Clock switch within the PN
3. PNC interchange
4. PN WARM reset
5. PN COLD reset

The EPN Sanity Audit feature activates only when every existing maintenance operation has failed to detect the PN problem. The EPN Sanity Audit serves as a safety net for the PN.

NOTE:
It is not clear why certain types of PN problems activate this feature. Thus, error log entries related to these problems do not specify which hardware to replace. The error log entries only indicate that some drastic recovery action occurred due to an unknown problem. However, clues as to the root cause of the PN outage may be present in the Error Logs and the Alarm Logs of the following MOs: TDM-BUS (TDM Bus) on page 1832, "EXP-INTF (Expansion Interface Circuit Pack)", and TDM-CLK (TDM Bus Clock) on page 1847, "EXP-PN (Expansion Port Network)", and PNC-DUP (PNC Duplication) on page 1477. You should refer to these maintenance sections during troubleshooting operations.

Error Log Entries and Test to Clear Values

Table 376: EPN-SNTY Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any			None
8801 (a)	Any	None			
8803 (b)	Any	None			
9901 (c)	Any	None			
9902 (d)	Any	None			
9903 (e)	Any	None			
9904 (f)	Any	None			
9905 (g)	Any	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a Error 8801 — the PN is unable to send up-link control messages, and the control channel of the PN's TDM bus is swapped as part of the recovery procedure.

b Error 8803 — the PN is unable to send up-link control messages and the PN's Tone-Clock is swapped as part of the recovery procedure.

c Error 9901 — the PN is unable to send up-link control messages, but recovers after the control channels of the PN's TDM bus are swapped.

d Error 9902 — the PN is unable to send up-link control messages, but recovers after the PN's active Tone-Clock is swapped.

e Error 9903 — the PN is unable to send up-link control messages, but recovers after a PNC interchange has taken place.

f Error 9904 — the PN is unable to send up-link control messages, but recovers after a PN WARM reset.

g Error 9905 — the PN is unable to send up-link control messages, but recovers after a PN COLD reset.

ERR-LOG (Error Log)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
ERR-LOG	none	none	Error Log

The ERR-LOG MO is responsible for the sanity of the Alarm Log, the Hardware Error Log, and the Software Error Log. If an inconsistency is detected in any one of these logs, every log will be re-initialized and a hardware error will be logged against ERR-LOG indicating the time of inconsistency. There are no tests and no alarms for the Error Log MO. This MO exists solely for the purpose of allowing errors to be logged against it.

Hardware Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
510 (a)	See Note	none	none	none	none

Error Notes:

a An inconsistency was detected in either the Alarm Log, the Hardware Error Log, or the Software Error Log. The system attempts to recover the logs but, depending on the extent of the corruption, some or all entries in the logs may be lost. Any alarms that were active at the time of this error have been cleared. There is no associated test for this error.

The Aux Data value indicates when the inconsistency was found:

0	During a periodic audit of the Error Log
1	After an extended reboot
2	After a reboot
S8100: 3	After a Reset System 3 (Cold_1)
4	After a Level-3 System Reset (Cold_1)
S8100: 4	After a Reset System 2 (Cold_2)
8	After a Level-2 System Reset (Cold_2)
16	After a Level-1 System Reset (Warm Start)
100	After an internal software audit
2500	After a single-process (MDM) restart

ETH-PT (Control LAN Ethernet)

S8700 / S8500 / S8100 / S8300

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
ETH-PT	MAJOR	**test port *location* long**	MO_ETH_PT
ETH-PT	MINOR	**test port *location* long**	MO_ETH_PT
ETH-PT	WARNING	**test port *location* short**	MO_ETH_PT

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN799DP Control LAN (C-LAN) packet port circuit pack provides TCP/IP connection to adjuncts applications such as CMS, Intuity, and DCS Networking. The C-LAN circuit pack has one 10baseT Ethernet connection and up to 16 DS0 physical interfaces for PPP connections. Multiple C-LAN circuit packs in a system provide additional TCP/IP capacity.

NOTE:
S8300 / **G700**: Although the ETH-PT MO is provided for a G700 media gateway, this MO only partially supports the G700's MG-ANN virtual media module.

An RSCL (remote socket control link) links the C-LAN and the media server to pass call-control and other management information. Since one link serves every port on the circuit pack, maintenance of the RSCL is part of the C-LAN circuit pack's maintenance.

NOTE:
The TN799DP C-LAN circuit pack replaces the PGATE and PI circuit packs in the G3r and G3si/G3vs systems, respectively. The PGATE or PI can be used with the C-LAN to create an X.25-to-TCP/IP bridge for adjunct and DCS connections.

Control LAN Congestion Controls

The switch activates congestion controls on C-LAN when it detects buffers exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffers have returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises MINOR alarm.
Exhausts buffers	Raises MINOR alarm.
Ceases for 12 minutes	Retires MINOR alarm.

Error Log Entries and Test to Clear Value

Table 377: ETH-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **s**
1 (a)	0	Ethernet Local Looparound test (#1278)	MINOR	ON	**test port** *UUCSSpp* **l r 3**
513 (b)	0	Link Integrity Inquiry (#1282)	MINOR	OFF	**test port** *UUCSSpp* **r 2**
769 (c)	0		WARNING	OFF	
1281 (d)	0				
1537, 1538 (e)		Session Status test (#1286)	MINOR	OFF	
1793–1920 (f)					
2305–2560 (g)					
2561–2816 (g)					
3329 (h)		TCP/IP Ping test (#1281)	WARNING	OFF	

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Notes:

a **Error Type 1** — Ethernet Local Looparound test (#1278) failed.

1 Test the port (**test port *UUCSSpp* long**).

2 Refer to repair procedures for Test #1278.

b **Error Type 513** — Link Integrity Inquiry test (#1282) failed, or C-LAN port detected loss of Ethernet link integrity.

Possible causes:

- Cabling
- Ethernet transceiver

1 Test the port (**test port *UUCSSpp* long**).

2 If the Link Integrity Inquiry test (#1282) fails, refer to its repair procedure.

c **Error Type 769** — Port received invalid frame.

Invalid Ethernet frame errors occur when the frame:

- Contains a bad cyclic redundancy check (CRC)
- Is misaligned

1 Isolate the problem with the Ethernet Local Looparound test (#1278).

2 Test the port (**test port *UUCSSpp* long).**

3 Verify the repair with the Ethernet Local Looparound test (#1278).

4 Clear the alarm (**test port *UUCSSpp* long clear**).

d **Error Type 1281** — System software received an indication that the far end has requested a disconnect of a session on this link. This is a log-only error.

e **Error Type 1537–1538** — Some or all sessions on a port are down

If:	Then the switch raises:
Some sessions are down	WARNING alarm on circuit pack
Every session is down	MINOR alarm on circuit pack

1. Test the port (**test port *UUCSSpp* short**).
2. Refer to Session Status test (#1286) repair procedure to verify repair.

f **Error Type 1793–1920** — System software received an indication that a socket was closed due to an error.

The error type indicates the application associated with this socket. (Whereas, the Aux Data indicates the internal application number.)

Error Type	Application
1793	Unused
1794	DCS
1795	AUDIX
1796	CMS
1797	ISDN Gateway
1798–1920	Reserved for future

g **Error Type 2305–2816** — System software detected a session is down. Aux Data indicates the session number. These are log-only errors. Error types 2305–2560 are for session numbers 1–256. Error types 2561–2816 are for session numbers 257–512.

h **Error Type 3329** — TCP/IP Ping test failed.

1. Test port (**test port *UUCSSpp* short**).
2. Refer to TCP/IP Ping test (#1281) repair procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order they appear in the following table.

Table 378: System Technician-Demanded Tests: ETH-PT

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Ethernet Local Loop-Around test (#1278)		X	D
TCP/IP Ping test (#1281)	X	X	ND
Session Status test (#1286)	X	X	ND
Link Integrity Inquiry test (#1282)	X	X	ND

1 D = Destructive, ND = Nondestructive

Ethernet Local Loop-around Test (#1278)

This test is **destructive**.

Use this test to check circuitry in the data path for an Ethernet call (from the on-board processor to the Ethernet Transceiver). This test fails if the data it receives does not match the data it transmits.

Table 379: Test #1278 Ethernet Local Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. **1** Determine status of port (**status clan-port *UUCSSpp***). **2** Retry the command when the port is idle. You can force the port to the idle state by executing **busyout port *UUCSSpp***. **NOTE:** The **busyout port** command is destructive, causing every call and link associated with the port to be torn down.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** If the problem persists, reset the circuit pack (**busyout board *UUCSS*, reset board *UUCSS*,** and **release board *UUCSS***). **2** If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** If the problem persists, escalate the problem.
2100	ABORT	Could not allocate the necessary resources to run test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** If the problem persists, escalate the problem.

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Table 379: Test #1278 Ethernet Local Loop-Around Test

Error Code	Test Result	Description / Recommendation
1	FAIL	Circuit pack detected failure in the Ethernet Local Looparound test (#1278). **1** If the problem persists, reset the circuit pack (**busyout board *UUCSS,* reset board *UUCSS,*** and **reset board *UUCSS***). **2** If the problem persists, replace the circuit pack.
	PASS	The circuitry tests properly.

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TCP/IP Ping Test (#1281)

This nondestructive test fails if every endpoint fails to respond. Use this test to check the circuitry in the data path for a peer-to-peer IP layer connection.

Table 380: Test #1281 TCP/IP Ping Test

Error Code	Test Result	Description / Recommendation
1, 2, 11	ABORT	Internal error **1** Retry the command at 1-minute intervals up to 3 times. **2** If the problem persists, escalate the problem.
7	ABORT	Destination unreachable. **1** Verify that there is a destination to ping in the routing table (list ip-route and look for destinations reachable through this Ethernet port). **2** If there are no reachable destinations from this port (i.e., no routes administered on Ethernet), administer a route and retry. **3** Escalate if the problem persists.
1005	ABORT	Incorrect test configuration. **1** Verify Ethernet link is in service (**status port *UUCSSpp*** or **status link *n***). **2** Verify that Ethernet link is enabled (**status port *UUCSSpp*** or **status link *n*** or **display data-module**). **3** Verify routing table has reachable destinations. **4** Repeat the test. **5** If problem persists while the Ethernet link is in service and enabled, escalate the problem.

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Table 380: Test #1281 TCP/IP Ping Test

Error Code	Test Result	Description / Recommendation
1124	ABORT	Ethernet link is not enabled. **1** Verify that the Ethernet link is enabled (**status port *UUCSSpp***, **status link *n***, or **display data-module**). **2** If the link is not enabled, enable the link (**change data-module**). **3** Repeat the test. **4** Escalate if the problem persists.
1125	ABORT	Ethernet link not in service. **1** Verify Ethernet link is in service (**status port *UUCSSpp*** or **status link *n***). **2** If the link is not in service, release the link using (**release link *n*** or **release port *UUCSSpp***). **3** Repeat the test. **4** Escalate if the problem persists.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Reset the circuit pack (**busyout board *UUCSS*, reset board *UUCSS*,** and **release board *UUCSS***). **2** If the test fails again, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
1003	FAIL	Ping to the destination failed due to on-board problem. **1** Retry the command at 1-minute intervals, up to 3 times. **2** If the problem persists, reset the circuit pack (**busyout board *UUCSS***, r**eset board *UUCSS***, and **release board *UUCSS***). **3** If the problem persists, re-administer the Ethernet connection through a different Ethernet port, if available. **4** If the problem still persists, or if there are no other available Ethernet ports, replace the circuit pack.

Table 380: Test #1281 TCP/IP Ping Test

Error Code	Test Result	Description / Recommendation
1007	FAIL	Ping to the destination failed due to the destination down. **1** Verify that at least one destination reachable through this port is up. Ping this destination (**ping ip-address *xxx.xxx.xxx.xxx***). **2** If the ping to any destination is successful through this port, the link is up, although some destinations are unreachable. Ignore the failure. **3** If ping to every destination fails, test this port (**test port *UUCSSpp* short**), and follow the repair procedures for Session Status test (#1286) failures.
	PASS	TCP/IP Ping test (#1281) is successful.

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Link Integrity Inquiry Test (#1282)

This **non**destructive test queries the C-LAN Ethernet port's physical connections.

If . . .	Then the test . . .
C-LAN connection is present,	Passes.
C-LAN connection is absent,	Fails.
There is no response,	Aborts.

Table 381: Test #1282 Link Integrity Inquiry Test

Error Code	Test Result	Description / Recommendation
1124	ABORT	Ethernet link is not enabled. **1** Verify that the Ethernet link is enabled (**status port *UUCSSpp***, **status link *n***, or **display data-module**). **2** If the link is not enabled, enable the link (**change data-module**). **3** Repeat the test. **4** Escalate if the problem persists.
1125	ABORT	Ethernet link not in service. **1** Verify whether Ethernet link is in service (**status port *UUCSSpp*** or **status link *n***). **2** If the Ethernet link is not in service, release the link (**release link *n*** or **release port *UUCSSpp***). **3** Repeat the test. **4** Escalate if the problem persists.

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Table 381: Test #1282 Link Integrity Inquiry Test

Error Code	Test Result	Description / Recommendation
1959	ABORT	Downlink message error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
	FAIL	Link integrity lost due to problem with attachment of Ethernet cable to the port. **1** Repeat the test. **2** If the test fails, verify that the cable properly is secured to Ethernet port and to the bus. **3** Verify the C-LAN circuit pack's link integrity LED is glowing. **4** Retry the test. **5** If problem persists, see Ethernet Local Loop-around test (#1278) repair procedures.
	PASS	The Ethernet Link Integrity test (#1282) detects good connections.

2 of 2

Session Status Test (#1286)

This **non**destructive test determines the status of every Ethernet port session. This test queries the system software on port session status.

If the system software indicates that. . .	Then the switch . . .
Every port session is up (ALL UP)	Raises no alarm, or retires alarm
Some port sessions are up (SOME UP)	Raises WARNING alarm
Every port session is down (ALL DOWN)	Raises MINOR alarm

Table 382: Test #1286 Session Status Test

Error Code	Test Result	Description / Recommendation
1124	ABORT	Ethernet link is not enabled. **1** Verify that the Ethernet link is enabled (**status port UUCSSpp**, **status link *n***, or **display data-module**). **2** If the link is not enabled, enable the link (**change data-module**). **3** Repeat the test. **4** Escalate if the problem persists.
1125	ABORT	Ethernet link not in service. **1** Verify whether Ethernet link is in service (**status port *UUCSSpp*** or **status link *n***). **2** If the Ethernet link is not in service, release the link (**release link n** or **release port *UUCSSpp***). **3** Repeat the test. **4** Escalate if the problem persists.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** If the problem persists, reset the circuit pack (**busyout board *UUCSSpp*, reset board *UUCSS***, and **release board *UUCSS***). **2** If the problem persists, replace the circuit pack.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
1	FAIL	System software indicates at least one Ethernet link session is down (SOME UP). **1** Isolate downed sessions (**status port *UUCSSpp*** or **status link *n***). **2** Follow actions based on session information.
2	FAIL	System software indicates every Ethernet session is down (ALL DOWN). **1** Test the port (**test port *UUCSSpp***) to verify the Ethernet Local Looparound test (#1278) result. **2** If test passes, wait for system software to indicate ALL UP. If not, check the destination and other components in the path. **3** If the destination and other components in the path are in service, take action based on session information.
	PASS	Every session is up.

ETR-PT (Enhanced Tone Receiver Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
ETR-PT	MAJOR	**test port *location* sh**	Enhanced Tone Receiver Port
ETR-PT	MINOR	**test port *location* sh**	Enhanced Tone Receiver Port
ETR-PT	WARNING	**test port *location* sh**	Enhanced Tone Receiver Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
Replacing the Tone-Clock circuit pack requires a special procedure which is described in TONE-BD (Tone-Clock Circuit) on page 1902. That section also describes the LED display for this board.

The ETR-PT MO is supported by TN2182 and TN2312AP circuit packs.

S8100

The TN744D circuit pack is the only tone detector board used in the S8100. The TN744D provides mu-law or A-law tone detection capability.

TN2312AP IPSI Circuit Pack's Tone-Clock

For a PN with a TN2312AP IPSI, the TONE-BD MO is a module located on the IPSI circuit pack. It provides tone generation, tone detection, call classification, and clock generation and synchronization. The TN2312AP replaces the TN2182B Tone-Clock board and is inserted into each PN's Tone-Clock slot. For a non-IPSI PN, the TN2182B Tone-Clock circuit packs provide the previous functions.

The TN2312AP IPSI circuit pack (for PNs equipped with IPSIs) or the Tone-Clock circuit packs (for non IPSI PNs) both house two independent components:

- Tone Generator that provides every tone needed by the system
- Clock that generates clocks for both the system's Time Division Multiplex (TDM) bus and the LAN bus. It also aids in monitoring and selecting internal synchronization references.

When resolving errors/alarms on an IPSI or Tone-Clock circuit pack, the following sections should also be consulted:

- For a non-IPSI PN, use the **set tone-clock *UC*** command to establish the tone and synchronization resources for the system.
- For an IPSI PN, uUse the **set ipserver-interface *UC*** command to establish the tone and synchronization resources for the system.

- TONE-PT (Tone Generator)
- TDM-CLK (TDM Bus Clock)
- SYNC (Synchronization)
- TONE-BD
- PKT-INT (IPSI only)

TN2182 Tone-Clock Circuit Pack (for Non-IPSI Connected PNs)

A TN2182 is a combined Tone Generator/Tone Detector board. It provides eight Enhanced Tone receiver (ETR) ports. Each of these ports provides the functions previously found individually on DTMR-PTs, GPTD-PTs and CLAS-PTs ports. Each port on the TN2182 may be used for any tone-detection function that was previously done by TN748, TN420, or TN744 Tone Detection boards.

The TN2182 provides Mu-law or A-law tone-detection capability.

Since the TN2182 also provides Tone-Clock function, only one TN2182 circuit pack may reside in a PN (or two if your system is duplicated). If more tone-detection resources are needed, the additional resources must be provided by TN748, TN420, or TN744 circuit packs.

Error Log Entries and Test to Clear Values

Table 383: ETR-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	any	‘‘Test #43 Tone Detector Audit/Update Test’’	MAJ/ MIN	ON	**test port** *UUCSSpp* **r 2**
18		**busyout port**	WARNING	OFF	**release port** *UUCSSpp*
257 (a)(b)	17666	‘‘Test #43 Tone Detector Audit/Update Test’’	MAJ/ MIN	ON	**test port** *UUCSSpp* **r 3**
513 (a)(c)	any	‘‘Test #42 Tone Detection Verification Test’’	MAJ/ MIN	ON	**test port** *UUCSSpp* **r 3**

Notes:

a There are two possible alarm levels for this error type: major alarm and minor alarm. These alarm levels are dependent on the administered thresholds for TTR, CPTR, and CCTR. Each ETR port is capable of operating an any of these.

A major alarm is raised if the total number of ports capable of TTR, CPTR or CCTR detection currently in service is less than or equal to one-half of the administered TTR, CPTR, or CCTR threshold number. Otherwise, a minor alarm is raised. In either case, run the short test sequence against the port (ETR-PT) and follow the error code procedures for the individual tests.

The threshold number of ports for service is administered using the **change system-parameters maintenance** command.

If a major or minor alarm occurs, follow this repair procedure.

1. Use **list configuration carrier** to get the board type and location. If the board is TN744, then do steps 2–4; if it is TN2182 or TN2312AP, do steps 5–12.
2. Execute three commands: **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. Reset is required to reload RAM associated with the TN744's DSPs. This will take all eight tone detector ports out of service for a few seconds. Only four of the eight would be out of service due to the alarm. (There are four tone detectors on each of the two DSPs.) Other than the unlikely potential of running out of tone detector resources in the switch, there is no other effect when the board is reset.
3. Test the board (**test board *UUCSS* long**).
4. If the test passes, terminate the repair process. If the test fails, replace the board.
5. Check to see if the board is duplicated (**list cabine**t and **status port-network** on the affected PN).
6. If the board is not duplicated, use **test tone *UUCSS* long** to resolve the error. The long test resets the board and is required to reload on-board RAM associated with the DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds. This means no dial pulses or touch tones during this interval, which probably will not affect calls in progress but could cause a call origination to abort or cause a user to not get dial tone when going off hook.
7. If every test passes and the alarm does not resolve, retest (**test tone *UUCSS* long clear**).
8. If the test passes, terminate the repair process. If it fails, replace the circuit pack at the customer's convenience.
9. If the board is duplicated, switch to the standby side (**set tone/set ipserver-interface**).
10. Test the alarmed board (**test tone *UUCSS* long**). This resets the board and is required to reload on-board RAM associated with the circuit pack's DSPs.
11. If every test passes and the alarm does not resolve, retest with **test tone UUCSS long clear**.
12. If the test passes, terminate the repair process. If it fails, replace the board.

b The ETR-PT lost its translation. Testing the ETR-PT is sufficient to reload its translation. If testing the ETR port does not clear the error, then the circuit pack containing the defective ETR port should be replaced at a time when it is convenient to remove a clock board from the system. Follow the procedures described in TONE-BD (Tone-Clock Circuit) on page 1902 for replacing a Tone-Clock circuit pack.

c This error indicates the (ETR-PT) Enhanced Tone Receiver is having problems detecting touch tones, call-progress tones, or MFC tones. If this error type is persistently logged, then the circuit pack containing the defective ETR-PT should be replaced at a time it is convenient to remove a clock board from the board from the system. Follow the procedures described in the TONE-BD (Tone-Clock Circuit) on page 1902 section for replacing a Tone-Clock circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. By clearing error codes associated with the Tone Detection Verification test, for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification test (#42)	X	X	ND
Tone Detection Audit/Update test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test checks out a single ETR port's touch-tone receiver mode, MFC tone-detection/generation mode, and general-purpose tone-detection mode. During the test sequence, these modes are tested in the following order:

1 Touch-tone receivers

2 General-purpose, call-progress, and maintenance tones

3 MFC tones

Table 384: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
none	ABORT	The system was not able to allocate every resource needed for this test, **or** there was an internal system error.
1	ABORT	The system could not allocate every resource needed to test the tones.
1001	ABORT	The system was unable to put the ETR-PT in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This situation could occur when the system is heavily loaded. If the system is not heavily loaded, test the TDM-BUS with **test tdm**. **1** Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a Tone-Clock for the test connection. This may be caused by a heavy load on the system or by a faulted Tone-Clock. **1** Check to see if there are any alarms against the TONE-BD or TONE-PT in the PN where the test aborted. **2** If a new Tone-Clock has been inserted, allow about 1 minute for maintenance to run on the newly inserted circuit pack. **3** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 384: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Circuit pack's response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2006	ABORT	This abort code indicates that the active Tone-Clock circuit pack or a Tone Detector circuit pack may not be functioning properly. **1** Test the *active* Tone-Clock circuit pack in the PN with **test tone-clock *UUC***. **2** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1–122	FAIL	DTMF digits were not detected correctly. **1** Run the short test sequence with **test port *UUCSSpp* sh r 1**. **2** If the problem persists, the system is still operating properly but capacity is reduced. To restore performance to normal, replace the circuit pack with the defective ETR-PT.
102	FAIL	2225-Hz Modem Answer Tone was not detected correctly. This impacts call-classification operation. **1** Run the short test sequence via **test port *UUCSSpp* sh r 1**. **2** If the problem persists, the system can still operate properly but capacity is reduced. In order to restore performance to normal, replace the circuit pack containing the defective port. Follow the procedures described in TONE-BD (Tone-Clock Circuit) on page 1902 for replacing a Tone-Clock circuit pack.
130	FAIL	Forward or Backward MFC signals were not correctly generated or detected. This will impact MFC calls. **1** Run the short test sequence via **test port *UUCSSpp* sh r 1**. **2** If the problem persists, the system can still operate properly but capacity will be reduced. In order to restore performance to normal, replace the TN2182/TN2312AP circuit pack (**S8100**: TN744) containing the defective ETR-PT. Follow the procedures described in TONE-BD (Tone-Clock Circuit) on page 1902 for replacing a Tone-Clock circuit pack.
	PASS	Tone detection verification is successful. The ETR port is able to detect/generate every necessary tone.

Tone Detector Audit/Update Test (#43)

A Digital Signal processor sanity audit is performed on the ETR-PT.

Table 385: Test #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description / Recommendation
none	ABORT	The system could not allocate every resource needed for this test.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 385: Test #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description / Recommendation
	FAIL	Hardware audit failed. **1** Use **list configuration carrier** to get the board type and location. If the board is TN744, then do steps 2–4; if it is TN2182/TN2312AP, do steps 5–12. **2** Execute three commands: **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. Reset is required to reload RAM associated with the TN744's DSPs. This will take all eight tone detector ports out of service for a few seconds. Only four of the eight would be out of service due to the alarm. (There are four tone detectors on each of the two DSPs.) Other than the unlikely potential of running out of tone detector resources in the switch, there is no other effect when the board is reset. **3** Test the board (**test board *UUCSS* long**). **4** If the test passes, terminate the repair process. If the test fails, replace the board. Follow the procedures in TONE-BD. **5** Check to see if the board is duplicated (**list cabinet** and **status port-network** on the affected PN.) **6** If the board is not duplicated, use test tone UUCSS long to resolve the error. The long test resets the board and is required to reload on-board RAM associated with the TN2182's/TN2312AP's DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds. This means no dial pulses or touch tones during this interval, which probably will not affect calls in progress, but could cause a call origination to abort or cause a user to not get dial tone when going off hook. **7** If every test passes and the alarm does not resolve, retest (**test tone *UUCSS* long clear**). **8** If the test passes, terminate the repair process. If it fails, replace the circuit pack at the customer's convenience. Follow the procedures in TONE-BD. **9** If the board is duplicated, switch to the standby side (**set tone/set ipserver-interface**). **10** Test the alarmed board (test tone UUCSS long). This resets the board and is required to reload on-board RAM associated with the TN2182's/TN2312AP's DSPs. **11** If every test passes and the alarm does not resolve, retest with **test tone *UUCSS* long clear**. **12** If the test passes, terminate the repair process. If it fails, replace the board. Follow the procedures in TONE-BD.
	PASS	The ETR port has passed the sanity inquiry.

EXP-INTF (Expansion Interface Circuit Pack)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
EXP-INTF	MAJOR	**test board *location* s**	Expansion Interface circuit pack
EXP-INTF	MINOR	**test board *location* s**	Expansion Interface circuit pack
EXP-INTF	WARNING	**test board *location* s**	Expansion Interface circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

WARNING:

If the Expansion Interface (EI) circuit pack you are troubleshooting is associated with a Survivable Remote EPN (SREPN), before the SREPN can be returned to normal service, every LAPD EI link problem must be cleared, and the SREPN slide switch on the TN2301 (located in the SREPN carrier) must be **manually** set to the normal position. See Restoring Normal Service to the SREPN on page 917 in this section.

Refer also to *Avaya MultiVantage™ Solutions Installation and Maintenance for Survivable Remote EPN, 555-233-121*.

Following this introductory description of the Expansion Interface (EI) circuit pack are sections on the following topics:

- "EI In-Service Mechanism"
- "Survivable Remote EPN"
- "LEDs"
- "EI and Tone-Clock Interactions"
- "Replacing an EI Circuit Pack—Unduplicated PNC"
- "Replacing an EI Circuit Pack— Duplicated PNC"
- "Expansion Interface Manual Loop-Back Procedure"

The TN570 or the TN776 Expansion Interface (EI) circuit pack provides a TDM- and packet bus-to-fiber interface for the communication of signaling information, circuit-switched connections, and packet-switched connections between endpoints residing in separate PNs. EI circuit packs are connected via optical fiber links. An EI can be connected to:

- Another EI — in a direct-connect configuration
- A DS1 converter in a DS1 converter complex — used to remote a PN
- A Switch Node Interface (SNI) — in a center stage switch (CSS) configuration
- A survivable remote EPN (SREPN)

In a CSS configuration with duplicated Port Network Connectivity (PNC), EI circuit packs reside in the Switch Node Carrier (see Figure 63, Center Stage Switch Configuration with Duplicated PNC, on page 915). In this case, the EI and SNI circuit packs may be connected via a metallic cable instead of an optical fiber link. Metallic cable should be tested and replaced in the same manner as optical fiber.

A PN-to-PN connection can be extended through a DS1 converter complex. (See Figure 64, Fiber Link with DS1 Converter Complex, on page 916). When discussing problems that may be related to fiber links, the DS1 converter is considered part of the fiber link. If diagnosis of the problem points to fiber connectivity **and** a DS1 converter circuit pack is part of the connectivity, problems with the DS1 converter circuit pack should be investigated (see DS1C-BD on page 840). The DS1 converter circuit pack enters into diagnostics for the EI circuit pack via such tests as the Neighbor Query test (#237), the Fiber Out-of-Frame test (#238), the Two-Way Transmission test (#241), and the Packet Transmission test (#589).

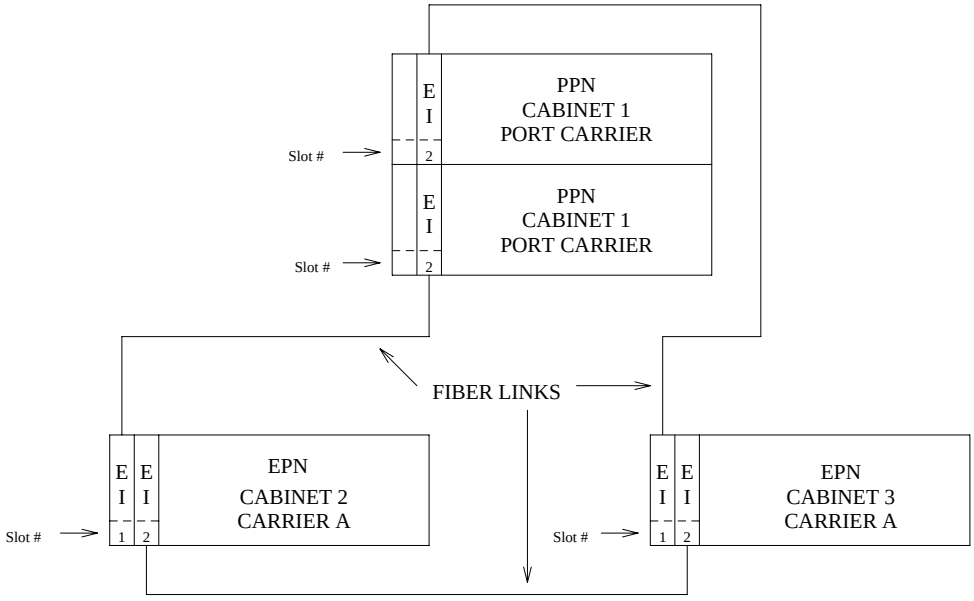
In a critical-reliability system, the fiber link's are duplicated as part of PNC duplication. In a high-reliability system with a CSS (Center Stage Switch) and unduplicated PNC, a single point of failure between the media server and the CSS is eliminated by duplicating each link, consisting of:

- SNI in the CSS to which the PN's EI connects
- Physical fiber paths between them

These dual connections normally share the call-processing load. Should one of these links fail, the entire load can be shifted to the operational link.

Figure 60, Direct Connect Configuration with Unduplicated PNC, on page 912 shows the location of the EI circuit packs in a typical unduplicated PNC, direct connect configuration.

Figure 60: Direct Connect Configuration with Unduplicated PNC

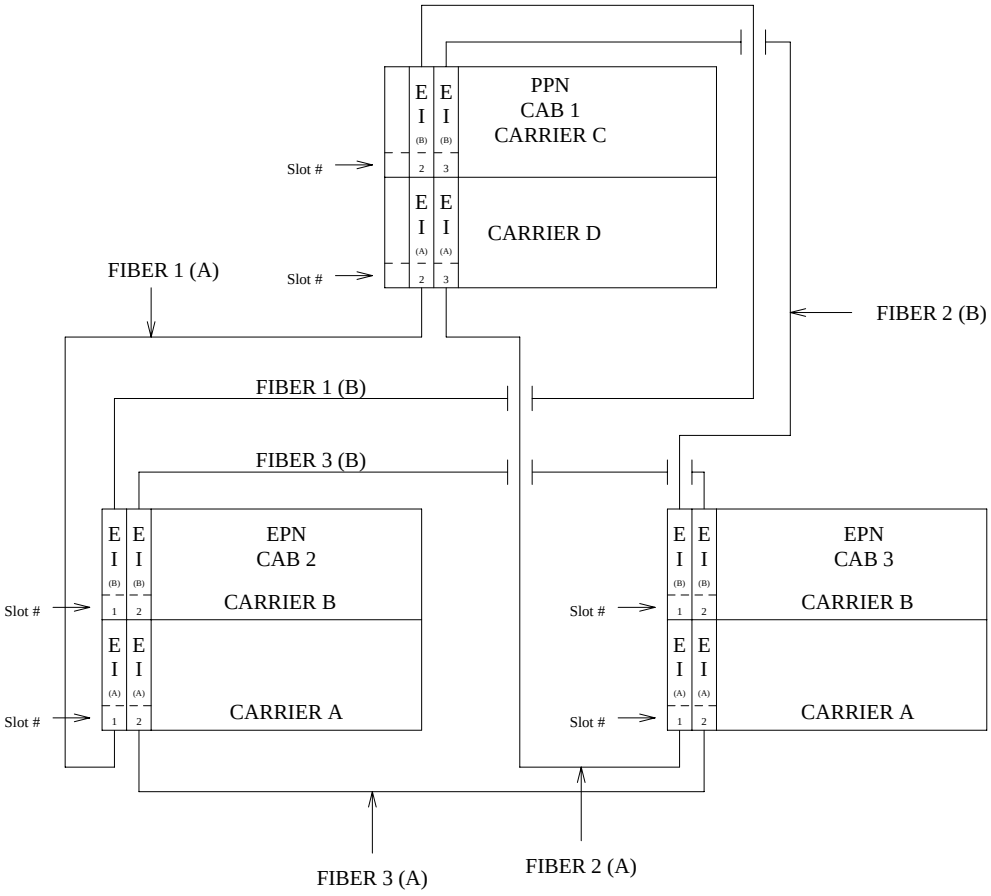


Each PN in a direct-connect configuration must be connected to the other PNs through a fiber link. Each PN has one EI that functions as an Archangel. This EI must be connected with fiber to an EI. If an EI is

functioning as an Archangel (bus master), its amber LED will be flashing at a rate of 2 seconds on and 200 ms off.

Figure 61, Direct Connect Configuration with Duplicated PNC, on page 913 shows the location of EI circuit packs in a typical duplicated PNC, direct-connect configuration.

Figure 61: Direct Connect Configuration with Duplicated PNC



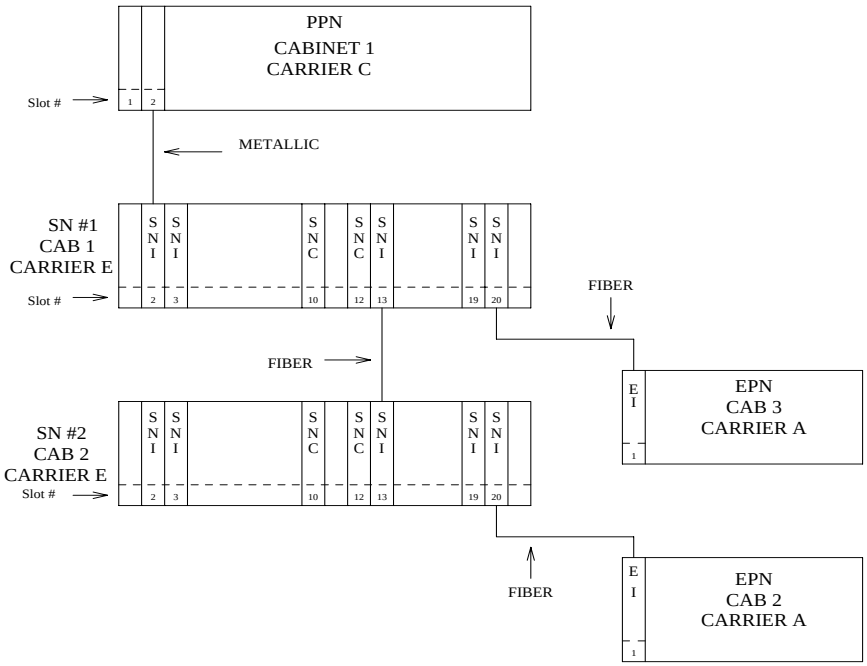
In a duplicated PNC there is an A-side and a B-side PNC. Every EI in this diagram is labeled with an A or a B designating to which PNC it belongs. Note that a PNC's designation (A or B) does not relate directly to the carrier where its EIS reside. Again, only one of a PN's EIs can function as the Archangel (TDM-bus master). A PN's EI that is:

- On the active PNC
- Logically connected to the media server

is the only one that can function in this mode. In normal operation, its amber LED should be blinking at a rate of 2 seconds on and 200 ms off.

Figure 62, Center Stage Switch Configuration with Unduplicated PNC, on page 914 shows the location of EIs in a typical center stage switch configuration with unduplicated PNC.

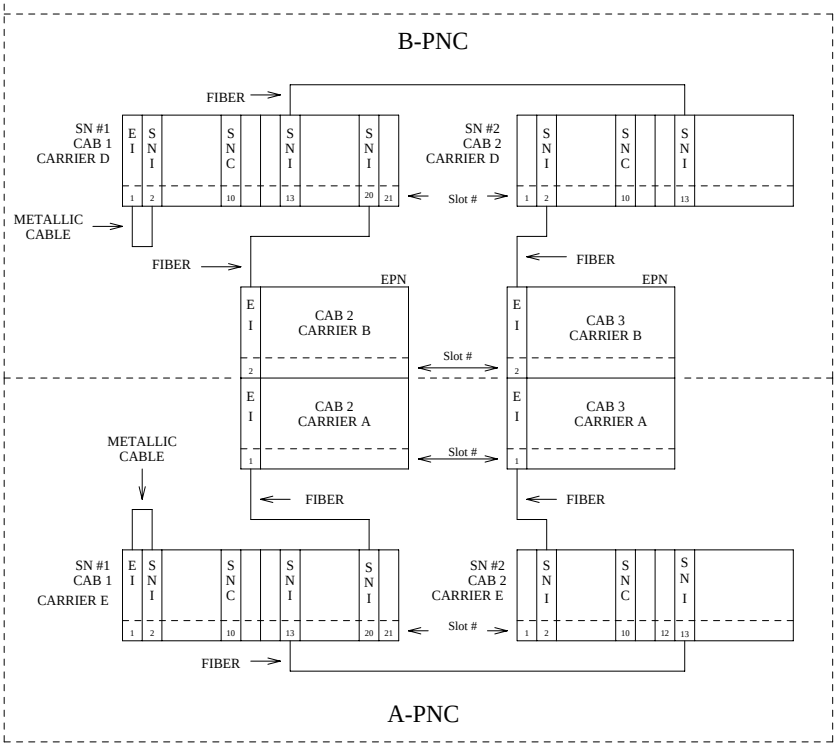
Figure 62: Center Stage Switch Configuration with Unduplicated PNC



For an unduplicated stage switch configuration, only one EI is needed in each PN. Notice that there is no direct connection between the PNs, rather every inter-PN connection is made through the center stage switch. Each SNI in the switch node carriers can be connected to a PN through an EI circuit pack.

Figure 63, Center Stage Switch Configuration with Duplicated PNC, on page 915 shows the location of EIs in a typical two Switch Node Center Stage Switch configuration with duplicated PNC.

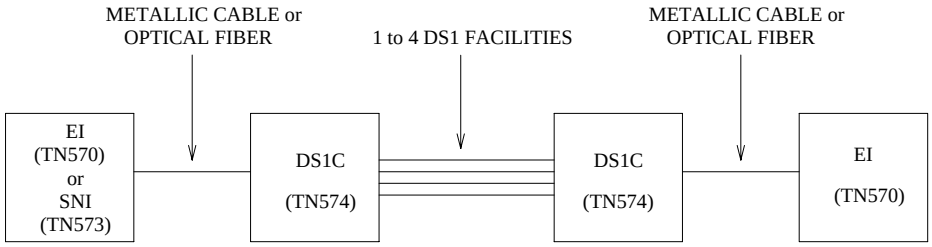
Figure 63: Center Stage Switch Configuration with Duplicated PNC



In a duplicated center stage switch configuration, two EIs are needed in each PN. One resides in the PNC's A side and one in the B side. Note that a PNC designation (A or B) does not directly designate the carrier where an EI resides. The active PNC's EI is the one acting as the PN's Archangel (TDM bus master). This EI's amber LED should be blinking at a rate of 2 seconds on and 200 ms off. Whereas, the amber LED on standby PNC's EI should be off.

A PN (and thus, the EIs contained within it) can be remoted via a DS1 Converter complex. This requires that a fiber link (providing connectivity to the remoted PN) be administered with an associated DS1 Converter complex. This complex consists of two TN574 DS1 Converter (DS1C-BD) circuit packs connected by from 1 to 4 DS1 facilities. Figure 64, Fiber Link with DS1 Converter Complex, on page 916 shows where the DS1 converter complex fits into an EI-to-SNI or EI-to-EI fiber link. For more information, see DS1C-BD on page 840.

Figure 64: Fiber Link with DS1 Converter Complex



EI In-Service Mechanism

In order for calls to be routed through a given PN, the EI that is part of the connectivity to that PN must be put into service. In order for an EI to be put into service, the following criteria must be met:

1. The EI must be recognized by software (inserted). Use **list config carrier** to verify that the board is recognized by software.
2. The EI must have a fiber link administered to it. Use **list fiber-link** to verify that this EI circuit pack has a fiber administered to it.
3. The EI must have established a LAPD link to its neighbor (the circuit pack on the "other end" of the fiber link). This neighbor can be another EI or an SNI.

CAUTION:
If previous requirements 1 and 2 have been met, and the amber LEDs are flashing in a manner that appears to confirm that the EI circuit pack has established a LAPD link to its neighbor, the circuit pack still may not be "in service". The requirement is that it must have the CORRECT neighbor on the other end of the fiber. Care must be taken when connecting the fibers to the back of the carriers so that fibers are connected to the correct circuit packs. In a Center Stage Switch configuration, run the "configuration audit" test against the SNI circuit pack that is the neighbor of the EI circuit pack in question (see SNI-BD (SNI Circuit Pack) on page 1667 for more details).

Once an EI has been put into service, if any of the previously listed in-service criteria become untrue, the EI is taken out of service, and service to that PN is not available.

In a system that is configured with PNC duplication active, taking an EI out of service that is on the active PNC will, if all other things on the active and standby PNC are equal (i.e., both PNCs are equally healthy, the standby PNC is not busied out, the PNC is not locked by software), result in a PNC interchange.

Survivable Remote EPN

The Survivable Remote EPN (SREPN) feature allows a S8700 Multi-Connect EPN (either MCC or SCC) to provide service to the customer when:

- Its fiber (or T1/E1 EI link to the S8700 Multi-Connect processor) fails or is severed
- The S8700 Multi-Connect processor or center stage fails.

NOTE:
This feature is viewed as a “disaster recovery operation” capability rather than as an additional reliability option.

The SREPN allows a remote EPN cabinet to provide processor capabilities to the EPN in the event of a failure. A logic switch circuit pack (TN2301) located in the SRPPN detects when the link to the S8700 Multi-Connect is down and switches to a link from the local SRPPN (TN790-based processor). When the links to the S8700 Multi-Connect are restored and verified to be stable, the logic switch is ***manually reset***, and the EPN is reconnected to the links from the S8700 Multi-Connect.

NOTE:
The SREPN feature is not available when an ATM-PNC/EI circuit pack is used to replace the TN570 EI circuit pack in a direct-connect configuration, or an ATM Switch is providing the Center Stage (PNC) connectivity.

NOTE:
If you suspect a problem with the TN790B-based R6si SRPPN use the R6si maintenance documentation supplied with the SREPN feature to resolve any alarms/errors associated with the SRPPN carrier.

SREPN Feature Active

WARNING:
Every call within the SREPN is terminated when the SREPN feature is activated, and the R6si SRPPN takes control of the SREPN.

The SREPN feature is activated when the Maintenance circuit pack (TN775C or later and located in the SREPN) detects a problem with the SREPN’s EI (TN570B) LAPD link to its counterpart in a S8700 Multi-Connect EPN. The TN775C Maintenance circuit pack notifies the co-located SRPPN of the problem, and the TN2301 SRSwitch circuit pack in the SRPPN carrier switches the EI LAPD link connection from the S8700 Multi-Connect PPN to its counterpart in the S8300 Media Server with G700 Media Gateway SRPPN. The SREPN is now in the Survivable Remote mode and has the capabilities of an S8300 Media Server with G700 Media Gateway EPN that has been pre-translated with a *Disaster Recovery* configuration.

NOTE:
When SREPN feature is active, the EI circuit pack that is assigned to the SREPN and located in the S8700 Multi-Connect PN is put in loop-back mode.

Restoring Normal Service to the SREPN

WARNING:
Every call within the SREPN is terminated when the SREPN feature is returned to normal service.

To restore normal connections to the SREPN EI circuit pack in the S8700 Multi-Connect PN, you must:

1. Clear every error logged against the S8700 Multi-Connect SREPN EI circuit pack by using the suggested repair procedures outlined in this MO.

2 At the SRP flip the 3-position switch on the TN2301 to the RSTR (restore) or top position for at least 1 second and return the switch to the AUTO, or middle position.

3 After the SREPN slide switch has been restored to the normal position, test the connectivity to S8700 Multi-Connect EI LAPD link, by using the suggested procedures outlined in this MO.

4 After normal service is returned to the S8300 Media Server with G700 Media Gateway SREPN, the SRPPN will be in an *alarmed state*. This is *normal* for an SRPPN and indicates that the:

- SRSwitch (TN2301) has disconnected it from its neighbor (EI in the SREPN)
- SRPPN is no longer in control.

Connectivity has been reestablished between the EI in the SREPN and its counterpart EI circuit pack in the S8700 Multi-Connect PN. The system is now in a normal S8700 Multi-Connect EI configuration.

LEDs

SREPN Expansion Interface

The EI circuit pack has red, green, and amber LEDs. The red and green LEDs show the standard conditions:

- Red indicates an alarm condition.
- Green indicates maintenance testing in progress.

The amber LED is used to provide useful visual status information:

- Active EI circuit packs:
  - — Have their amber LED on solid (for an inter-EPN EI in a direct connect system)
  - — Blink a pattern of 2 seconds on and 200 ms off.
- The standby PNC EI circuit packs should have their amber LEDs off.

Another way to determine which PNC (and therefore, which EIs in an EPN) is active and which is standby, use the **status port-network** and **status PNC** commands.

See Table 386, Expansion Interface Circuit Pack Amber LED Flashing States, on page 918 for the possible EI amber LED states.

Table 386: Expansion Interface Circuit Pack Amber LED Flashing States

Condition	LED On	LED Off
Fiber Out-of-Frame (a)	0.1 second	0.1 second
In Frame-No Neighbor (b)	0.5 second	0.5 second
Expansion Interface Active (c)	2 second	0.2 second
Expansion Interface Active (d)	solid on	never off
Expansion Interface Standby (e)	never on	solid off

Notes:

a This flashing state corresponds to error codes 769 and 770 from the Hardware Error Log and indicates a failure of Test #238. These error codes are usually accompanied by error code 1281 (no EI or SNI detected on opposite end of fiber). This condition may be caused by the absence of the neighbor EI or SNI circuit pack, a broken or missing fiber, or a missing lightwave transceiver on either endpoint (EI or SNI circuit packs).

b This corresponds to error code 1281 from the Hardware Error Log and indicates a failure of Test #237. This condition is usually due to the failure of this EI circuit pack or a failed EIEI or SNI circuit pack counterpart.

c This is the normal state for an active PN EI circuit pack that is also the bus master (Expansion Archangel) in the EPN.

d This is the normal state for an active EI circuit pack that is not the bus master (Expansion Archangel) for a PN. This applies only in the direct-connect configuration where the EI circuit pack in a PN is connected via a fiber link to an EI circuit pack in the other PN.

e This is the normal state for a standby EI circuit pack in a PN.

NOTE:
In a PN, its TN775C Maintenance (MAINT) circuit pack monitors the sanity of the EI circuit pack. If the EI circuit pack should cycle between sane and insane several times, the Maintenance circuit pack will hold the EI circuit pack reset. If a new EI circuit pack is installed in the PN, and the red LED remains lit, the PN's Maintenance circuit pack should be removed because it may be holding the new EI circuit pack reset. This condition could present itself if there is a link problem to the PN, and the PN experiences several PN restarts. The Maintenance circuit pack may be reinstalled after the EI circuit pack has been physically inserted and the EI circuit pack's red LED has gone off.

The link between two active EI circuit packs or between an active EI circuit pack and an active SNI circuit pack is involved in synchronization. The EI circuit pack reports slip errors if synchronization is not operating properly. When diagnosing synchronization problems, the EI circuit packs should be examined as a possible cause.

Expansion Interface LEDs

The EI circuit pack has the standard red, green, and amber LEDs. The red and green LEDs have the traditional uses: red means some alarm condition and green indicates maintenance testing in progress. The amber LED is used to provide useful visual status information. The state of the amber LED is very important when executing the Expansion Interface Manual Loop-Back Procedure. The possible amber LED states are shown in Table 387, Expansion Interface Circuit Pack Amber LED Flashing States, on page 920.

Upon power-up, the red and green LEDs turn on and off. The amber LED goes to its appropriate state.

To determine which PNC (and which EIs in a PN) is active and which is standby, use the **status port-network** and **status pnc** commands. Alternately, visual inspection will show that the active EI circuit packs will have their amber LED on solid (for an inter-PN EI in a direct connect system) or blink a pattern of 2 seconds on and 200 ms off. The standby PNC EI circuit packs will have their amber LEDs off. See Table 387, Expansion Interface Circuit Pack Amber LED Flashing States, on page 920 for the possible EI amber LED states.

Table 387: Expansion Interface Circuit Pack Amber LED Flashing States

Condition	LED On	LED Off
Fiber Out-of-Frame (a)	0.1 second	0.1 second
In frame-No Neighbor (b)	0.5 second	0.5 second
Expansion Interface Active (c)	2 second	0.2 second
Expansion Interface Active (d)	solid on	never off
Expansion Interface Standby (e)	never on	solid off

Notes:

a Fiber Out-of-Frame - This flashing state corresponds to error codes 769 and 770 from the Hardware Error Log and indicates a failure of Test #238. These error codes will usually be accompanied by error code 1281 (no Expansion Interface or SNI detected on opposite end of fiber). This condition may be caused by the absence of the neighbor EI or SNI circuit pack, a broken or missing fiber, or a missing lightwave transceiver on either endpoint (EI or SNI circuit pack).

b In frame-No Neighbor - This flashing state corresponds to error code 1281 from the Hardware Error Log and indicates a failure of Test #237. This condition is usually due to the failure of this EI circuit pack or a failed EI or SNI circuit pack neighbor.

c This is the normal state for an active PN EI circuit pack that is also the bus master (Expansion Archangel) in the PN.

d This is the normal state for an active EI circuit pack that is not the bus master (Expansion Archangel) for a PN. This applies only in the Direct Connect configuration where the EI circuit pack in a PN is connected via a fiber link to an EI circuit pack in the other PN.

e This is the normal state for a standby EI circuit pack in a PN.

NOTE:
In a PN, its TN775C Maintenance (MAINT) circuit pack monitors the sanity of the EI circuit pack. If the EI circuit pack should cycle between sane and insane several times, the Maintenance circuit pack will hold the EI circuit pack reset. If a new EI circuit pack is installed in the PN, and the red LED remains lit, the PN's Maintenance circuit pack should be removed because it may be holding the new EI circuit pack reset. This condition could present itself if there is a link problem to the PN, and the PN experiences several PN restarts. The Maintenance circuit pack may be reinstalled after the EI circuit pack has been physically inserted and the EI circuit pack's red LED has gone off.

The link between two active EI circuit packs or between an active EI circuit pack and an active SNI circuit pack is involved in synchronization. The EI circuit pack will report slip errors if synchronization is not operating properly. When diagnosing synchronization problems, the EI circuit packs should be examined as a possible cause.

EI and Tone-Clock Interactions

The viability of the EI fiber link depends upon the system clock that is provided by the active Tone-Clock circuit pack on each network (see TDM-CLK (TDM Bus Clock) on page 1847 and TONE-BD (Tone-Clock Circuit) on page 1902). Each EI circuit pack transmits over the fiber at a rate derived from the system clock on its network. If the active Tone-Clock is defective in such a way that the frequency of system clock it produces is out of the specified range ("out of spec"), an EI fiber link might go down.

This affects an Expansion Archangel Link (EAL), a Remote Neighbor Link (RNL), and/or a Local Neighbor Link (LNL), even though the EI circuit packs are healthy. When the PNC is duplicated, both fiber links could go down if there is a defective active Tone-Clock.

Whether or not a fiber link goes down, depends on certain characteristics of the EI circuit packs. An EI circuit pack should not be replaced if the fiber link on which it resides goes down because of a defective active Tone-Clock circuit pack. The defective Tone-Clock circuit pack should be replaced instead. The EI circuit packs are more sensitive to a defective system clock than the rest of the components of the system. Therefore, testing of the Tone-Clock circuit pack might not reveal a problem.

The symptoms of the problem in which an invalid system clock causes an Expansion Link to go down are as follows:

- If the Tone-Clock in the PN provides the current on-line synchronization reference (see **status synchronization**), is providing an invalid system clock:

  Any EI or SNI circuit pack has a Fiber Out-of-Frame condition or a No Neighbor condition.

  An EI circuit pack amber LED blinks quickly when a Fiber Out-of-Frame condition exists (0.1 seconds on, 0.1 seconds off) and Test #238 fails on the EI circuit pack that is out-of-frame.

  An SNI circuit pack with a Fiber Out-of-Frame condition blinks its amber LED quickly (0.1 seconds on, 0.1 seconds off) and Test #989 fails on the SNI circuit pack that is out-of-frame.

  An EI circuit pack amber LED blinks slowly when a No Neighbor condition exists (0.5 seconds on, 0.5 seconds off) and Test #237 fails on this EI circuit pack, but Test #238 passes.

  An SNI circuit pack with a no neighbor condition blinks its amber LED slowly (0.5 seconds on, 0.5 seconds off) and Test #759 fails on this SNI circuit pack, but Test #989 passes.

- If a Tone-Clock in a PN that does not provide the current on-line synchronization reference (see **status synchronization**) is providing an invalid system clock:

  In a direct connect configuration, the PN EI circuit pack amber LED will blink quickly (Fiber Out-of-Frame condition – 0.1 seconds on, 0.1 seconds off).

  Test #238 fails on this EI circuit pack.

  In a CSS configuration, the SNI connected to the PN EI circuit pack blinks its amber LED quickly (Fiber Out-of-Frame condition – 0.1 seconds on, 0.1 seconds off).

  The PN EI circuit pack amber LED blinks slowly (In-frame, No Neighbor condition – 0.5 seconds on, 0.5 seconds off).

  If the PN is in service, Test #237 fails on this EI circuit pack, but Test #238 passes.

These symptoms can also be the result of other problems (for example, one half of the fiber being unable to transmit data). If the system exhibits these symptoms, execute the following procedure:

1 Verify that the PN stays down for at least 1 minute.

If the EAL comes back in service after a short time, without switching the active Tone-Clock, the problem was probably that the on-line synchronization source became invalid (See SYNC Maintenance documentation for more information).

However, if the EAL(s) have not come back into service after a minute, the synchronization source is not the cause of the problem. Proceed to step 2.

2 Check for errors via the **display errors** command with the `Category` field set to **tone** and the Active Alarms field set to **n**. Some of the alarms on PN objects might have been resolved if the PN went down. Refer to the appropriate MO Maintenance documentation for descriptions of any of the errors occurring at about the same time as the EXP-PN errors, SYS-LINK errors against EAL s, RNLs, or LNLs, or FIBER-LK (769, 1025, or 1281) errors. Resolve any active alarms.

Also, if Error Type 18 was logged against the SYNC MO when the PN went down, the problem was probably that the synchronization on-line reference became invalid. Since reference switching was disabled, the Tone-Clock did not switch from the invalid reference. Therefore, the Tone-Clock circuit pack put out a system clock that was “out of spec.” Issue the **enable synchronization-switch** command. If the PN is down, reseat the Tone-Clock circuit packs on the PN. This action should restore the PN to service.

Execute Steps 3 and 4 in the order most convenient to you and least destructive to the customer.

3 Check to see if the fiber-optic cable is transmitting properly via the following procedure on one of the out-of-service links, or use the Fiber link fault isolation in *Maintenance Procedures (555-245-103)*.

a Carefully record the symptoms (amber LED pattern and test failing) that were occurring on the PN EI circuit pack and the PN EI circuit pack or the connected CI circuit pack in the case of a Center Stage system. Clearly indicate what symptoms are occurring on which EI/SNI circuit pack.

CAUTION:

Before proceeding, note which is the current transmit fiber and which is the current receive fiber for proper reconnection.

b Disconnect the transmit and receive fiber pair from the lightwave transceiver behind one of the EI circuit pack slots that is exhibiting symptoms.

c Connect what was formerly the transmit fiber to the receive jack.

d Connect what was formerly the receive fiber to the transmit jack.

e Perform steps b, c, and d on the opposite end of the fiber and the lightwave transceiver behind the connected EI or SNI circuit pack slot.

f If the symptoms that were formerly occurring on the EI circuit pack that was exhibiting these symptoms are now occurring on the connected EI or SNI circuit pack and vice versa, the fiber is defective and should be replaced.

4 Determine whether the problem is due to a defective active Tone-Clock circuit pack. Refer to the preceding list of symptoms to decide which network contains the suspect active Tone-Clock.

CAUTION:

If you remove the PN EI circuit pack that is active or that was active when the PN was last in service, the Tone-Clock lead will revert to the default value which will cause the Tone-Clock circuit pack located in the A carrier to become the active Tone-Clock. This characteristic can be deceiving. Replacing or reseating the active PN EI circuit pack might restore the link(s) temporarily. However, if the Tone-Clock circuit pack located in the B carrier was really the source of the problem and not the EI circuit pack, then the link(s) will go down again the next time a Tone-Clock switch to the Tone-Clock in the B carrier is attempted (probably when the scheduled Tone-Clock switch occurs).

CAUTION:

If, after every link is restored, you suspect the problem might have been due to a defective Tone-Clock circuit pack, switch to this Tone-Clock at an appropriate time. If the Tone-Clock circuit pack was the cause of the problem and the same EI circuit packs are in place, the same link(s) will go down again.

a When the suspect Tone-Clock circuit pack resides in an in-service pot network (PN) with duplicated Tone-Clock circuit packs:

Switch to the standby Tone-Clock in this PN. If the suspect Tone-Clock is defective, the link(s) should be restored at this point. (Switching back to the defective Tone-Clock should take the same link(s) out of service.) This Tone-Clock is defective and should be replaced as soon as possible. If switching Tone-Clocks does not bring up the PN, then this Tone-Clock is not the source of the problem. Be sure to switch back to the original Tone-Clock.

CAUTION:
If a defective Tone-Clock circuit pack is left as the standby Tone-Clock, then a scheduled Tone-Clock switch will cause the same link(s) go out of service again.

b When the suspect Tone-Clock resides in an out-of-service PN:

Replace the active Tone-Clock circuit pack in this PN. In a PN with duplicated Tone-Clock circuit packs, the active Tone-Clock's amber LED is flashing. If both amber LEDs are flashing, the active Tone-Clock's LED is blinking slower.

CAUTION:
If a defective Tone-Clock circuit pack is left as the standby Tone-Clock, then a scheduled Tone-Clock switch will cause the same PN to go out of service again.

If replacing this circuit pack restores the link(s), then the circuit pack should be replaced as soon as possible. If not, then it was not the source of the problem.

Replacing an EI Circuit Pack—Unduplicated PNC

WARNING:
Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:
Replacing a Switch Node Interface, Switch Node Clock, Expansion Interface, or DS1 Converter circuit pack in a standard-, duplex-, or high-reliability system disrupts service. This service effect can range from an outage of a single PN to an outage of the entire system.

Step	Action	Explanation / Caution
1	Enter **busyout board UUCSS**.	UUCSS = cabinet-carrier-slot address of the circuit pack to be replaced.
2	Replace the circuit pack.	
3	Wait for the circuit pack to reset.	Red and green LEDs light and then go out. If the red LED remains lit, see the previous note under "Expansion Interface LEDs".
4	Enter **release board *UUCSS***.	**CAUTION:** *Do not busyout any EI circuit packs after this point.*
5	Enter **test alarms long clear** for category **exp-intf**.	
6	Wait 5 minutes for SNI-BD, FIBER-LK, **and** DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc.**	

Replacing an EI Circuit Pack— Duplicated PNC

WARNING:

On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WARNING alarm against TDM-CLK with error type 2305. Repairs to standby PNC in this state may disrupt service. Otherwise, if the active PNC is functional, replacement of a standby component will not disrupt service.

Step	Action	Explanation / Caution
1	Enter **status pnc**.	Verify that the component to be replaced is on the standby PNC.
2	Enter **busyout pnc**.	
3	Enter **busyout board *UUCSS***.	UUCSS represents the cabinet-carrier-slot address of the circuit pack to be replaced.
4	Replace the circuit pack.	
5	Enter **release board *UUCSS***.	**CAUTION:** *Do not busyout any EI circuit packs after this point.*
6	Enter **test alarms long clear** for category **exp-intf**.	
7	Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc** or **b-pnc**.	Use the letter designation of the PNC that holds the replaced component (the standby PNC).
8	Enter status pnc.	If either PNC's state of health (SOH) is not "functional," consult PNC-DUP (PNC Duplication) on page 1477.
9	Enter **release pnc**.	

If the red LED remains lit, see the previous note under ‘‘Expansion Interface LEDs’’.

Expansion Interface Manual Loop-Back Procedure

This procedure is to be used when an EI circuit pack cannot be tested by software. This occurs when the EI circuit pack resides in an out-of-service PN. A short length of optical fiber is required for this procedure.

If this procedure is run on both endpoints of a fiber link (EI circuit packs or SNI circuit packs), and both check out fine, then the failure is most likely in the fiber itself, assuming neither endpoint circuit pack is busied out and the link remains inactive.

1. Busyout the circuit pack (EI or SNI) with the **busyout board *UUCSS***.
2. Disconnect the transmit and receive fiber pair from the lightwave transceiver behind the circuit pack (EI or SNI) slot.

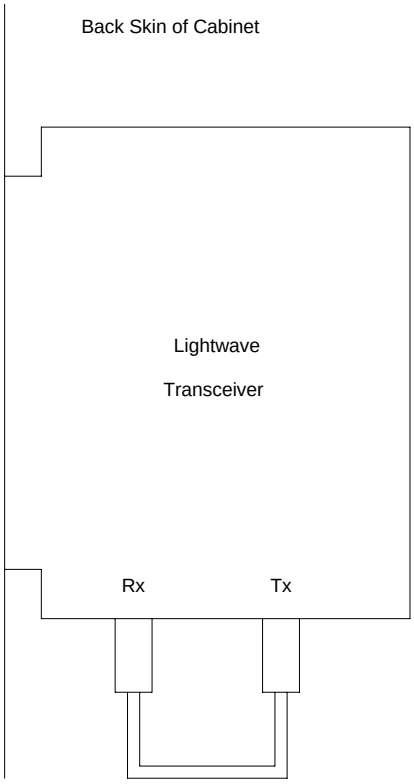
   NOTE:
   The fiber connected to the transmit side of the lightwave transceiver on one EI circuit pack should be connected to the receive side of the lightwave transceiver on the circuit pack on the opposite end of the fiber.

3. Using a fiber jumper cable, interconnect the transmit and receive jacks of the lightwave transceiver as shown in Figure 65, Interconnection of Lightwave Transceiver Transmit/Receive Jacks, on page 926.

   NOTE:
   Make sure that the total length of the fiber jumper cable does not exceed the maximum length recommended for the fiber link connections between cabinets. Using cable lengths not within connectivity guidelines can adversely affect test results.

4. Go to the front of the cabinet and inspect the amber LED.
   - If the amber LED flashes on at a rate of once per second, the (EI or SNI) circuit pack or transceiver should be replaced.
   - If the amber LED flashes on at a rate of five times per second, the circuit pack (EI or SNI) or the lightwave transceiver may need replacement. This condition may also be due to a faulty system clock on the network containing this EI circuit pack.
   - If the amber LED is not blinking, this circuit pack (EI or SNI) and the lightwave transceiver are functioning properly.
5. Replace faulty components and reconnect the original fiber. Be sure to reconnect the fibers properly as noted in step 3. If there is a problem with the PN after re-connecting the fiber, and the PN is connected to a Center Stage Switch, run the Configuration Audit via the **test board** command on the SNI circuit pack to which the intervening fiber is connected. See the SNI-BD section for instructions on interpreting results.
6. Release EI circuit pack or SNI circuit pack with the **release board *UUCSS*** command.

Figure 65: Interconnection of Lightwave Transceiver Transmit/Receive Jacks



Error Log Entries and Test to Clear Values

Table 388: EXP-INTF Error Log Entries

Error Type	Aux Data[1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[2]	0	Any	Any	Any	**test board** *UUCSS*
1	Any	EI Local TDM Looparound test (#240)	MAJOR	ON	**test board** *UUCSS* **r 2**
2		EI Local TDM Looparound test (#240)	MAJOR	ON	**test board** *UUCSS* **r 2**
18 (a)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board** *UUCSS*
23 (b)	0	None	WARNING	OFF	
125 (c)		None	MINOR	ON	
131 (d)		None	MINOR	ON	
257 (e)	Any	None	MINOR	OFF	
513 (f)	5–7	None	MAJOR	ON	

Table 388: EXP-INTF Error Log Entries

Error Type	Aux Data[1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
769 (g)	113	EI FOOF Query test (#238)	WARNING	OFF	**test board** *UUCSS* **r 1**
770		EI FOOF Query test (#238)	WARNING	OFF	**test board** *UUCSS* **r 1**
1025	Any	EI Control Channel test (#316)	MAJOR	ON	**test board** *UUCSS* **r 1**
1281 (h)		EI Neighbor Query test (#237)	MINOR	OFF	**test board** *UUCSS* **r 1**
1537		EI 2-way Transmission test (#241)	MAJOR	OFF	**test board** *UUCSS* **r 4**
1538 (i)		None	MINOR	ON	
1793		EI Lightwave Transceiver Looparound test (#242)	MAJOR	ON	**test board** *UUCSS* **l r 3**
2305 (j)	118	None	WARNING	OFF	
2306 (j)	3	None	WARNING	OFF	
	112				
2561 (k)	Any	None	MINOR	ON	
2817 (l)	Any	None	MINOR	ON	
3073 (m)	Any	EI Packet Interface test (#589)	MAJOR	OFF	**test board** *UUCSS* **r 3**
3074 (n)	2	EI Packet Interface test (#589)	MAJOR	OFF	**test board** *UUCSS* **r 3**
3075 (n)	1	EI Packet Interface test (#589)	MAJOR	OFF	**test board** *UUCSS* **r 3**
3076		EI Packet Interface test (#589)	MAJOR	OFF	**test board** *UUCSS* **r 3**
3330 (o)	Any	None	WARNING	ON	
3585 (p)	0	None	WARNING	OFF	
3841(q,s)	Any	None	MINOR	OFF	(s)
3842(r,s)	Any	None	MINOR	OFF	(s)
10001 (t)	0	None			

1 Aux Data 32767 for any error log entry indicates that an alarmed EI was busied out and then released. When this occurs, existing service affecting alarms must be preserved. As is typical, when the EI is released every alarm is resolved. Therefore the alarm and error logs must be repopulated with the alarms present at time of busyout. This error code is an indication that existing aux data and error log time stamps are no longer valid because they were lost when the alarms were resolved upon release of the circuit pack.

2 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a This error indicates that the EI circuit pack has been busied out via **busyout board *UCSS***. To resolve this error, release the EI circuit pack via **release board *UCSS***.

b EI circuit pack has been administered on the Circuit Pack screen, but has not been physically inserted into the system. Insert the circuit pack.

c A different circuit pack occupies the slot where this circuit pack is logically administered. To resolve this problem, either:

- Replace the incorrect circuit pack with the logically assigned circuit pack.
- Use **change circuit-pack** to reassign the slot to match the existing circuit pack. (If a fiber is assigned for the existing circuit pack, remove the fiber from translations before changing the circuit pack's translations.)

d This alarm is raised after an EI circuit pack has been removed from a slot for 5 minutes. The alarm will be resolved when the EI circuit pack is physically inserted into this slot and becomes recognized by software.

Another way to resolve or prevent this alarm is to use **change circuit pack** to remove the EI circuit pack administrative entry for this slot after the EI circuit pack has been removed from the slot.

It is also possible that the EI could be held in reset by the PN's Maintenance board (MAINT) and is not inserted in the system. Try issuing the **test maint *P* long** command on the Maintenance board in the same PN.

e Error Type 257—Indicates that this EI circuit pack is detecting incorrect data on the incoming fiber bit stream. The data is originating at the connected circuit pack (DS1 converter circuit pack, EI circuit pack, or SNI circuit pack).

1. Enter **display errors** and save a copy of the error log for use in later steps. Intervening repair procedures are likely to alter the contents of the error log and this information may be needed in later steps.
2. Perform the Fiber link fault isolation in *Maintenance Procedures (555-245-103)*.
3. If errors are still present or if this error occurs intermittently, replace the EI circuit packs, SNI circuit packs, DS1 converter circuit packs, or the transceivers on this link.
4. These errors could result from a bad timing reference on the network or switch node that contains the DS1 converter circuit pack, the EI circuit pack or SNI circuit pack on the opposite end of the fiber. Refer to the error log that was saved in step 1 and follow the associated repair procedure for EXP-INTF error 2305 to resolve this error. If there are any TONE-BD, TDM-CLK, or SYNC errors, resolve these errors as well.

f Error Type 513 with Aux Data 5–7— Indicates an ON BOARD hardware failure of the circuit packs RAM or ROM.

1. Replace the EI circuit pack.

g Besides running the test sequence and following procedures outlined for Test #238, perform the Fiber link fault isolation in *Maintenance Procedures (555-245-103)*.

h Error type 1281—The link to the neighbor circuit pack is broken or that the fibers have been connected incorrectly. Enter **test board *UUCSS*** and follow repair procedures for the tests.

i Error Type 1538—Indicates a hyperactive EI circuit pack that is generating an abnormal amount of control messages to the Processor. When this error was generated, the EI was automatically reset by the system. If this system does not have duplicated Port Network Connectivity, service to the PN will have been disrupted. If this system does have duplicated Port Network Connectivity, the system should have switched to the standby Port Network Connectivity.

1. Enter the **reset board *UUCSS*** command for this EI circuit pack.
2. If error 1538 is detected again, replace the EI circuit pack.

j Error Type 2305 with Aux Data 118—Indicates that the EI circuit pack has detected slips on the incoming fiber data stream. That is, a PN in a Direct Connect configuration, or a PN and a Switch Node in a Center Stage Switch configuration, are not synchronized.

1. Enter **display errors** and follow the repair procedures for *non-slip* errors against any SYNC, TDM-CLK, TONE-BD, DS1C-BD, EXP-INTF, SNC-BD, and SNI-BD. Non-slip errors are those *not* listed below:

Circuit Pack's Name	Name in Error Log	Log Entry (for Slips)
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
SNI	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160
DS1 converter circuit pack	DS1C-BD	3329

2. For slip errors, see SYNC (Port-Network Synchronization) on page 1751.

Error Type 2306—Indicates on-board failures related to system timing and synchronization. Perform the Fiber link fault isolation described in Chapter 6, "Troubleshooting" of *Maintenance Procedures (555-245-103)*.

k Error Type 2561—Indicates an on-board failure of EI circuitry related to handling packet data from the fiber interface and from the packet-bus interface.

1. If this error has generated a minor alarm, the EI circuit pack should be replaced.

l Error Type 2817—Indicates an on-board failure of EI circuitry related to transmission of data to the fiber interface.

1. If this error has generated a minor alarm, the EI circuit pack or transceiver should be replaced.

m Perform the following steps for error type 3073:

1. Execute the **display errors** command and resolve any errors on the following: PKT-BUS, PKT-INT, PDATA-BD, PGATE-BD, BRI-BD, BRI-PT, BRI-SET/ASAI, UDS1-BD.
2. Enter the **test board *UUCSS* r3** command for this circuit pack. If this error continues to appear, replace the EI circuit pack.

n Error Types 3074 and 3075—Failures of the EI circuit pack Packet Path test. This packet path test exercises circuitry on the EI circuit pack, the neighbor EI or SNI circuit pack, and any intervening DS1 converter circuit packs (if the PN is remoted).

1. Certain packet-bus faults can cause these errors without the EI being defective. Check to see if PKT-BUS errors are also present. If they are, use the PKT-BUS (Packet Bus - S8100) on page 1414 section of this chapter and Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)* to diagnose the problem.
2. If Error Type 3075 is present without Error Type 3074, replace the EI circuit pack.
3. If Error Type 3074 exists with or without 3075, run **test board *UUCSS*** on the EI, and follow the repair procedures for any test that does not pass.

4 If PKT-BUS errors are absent and replacing the EI does not resolve the problem, there is still the possibility of a packet-bus fault. See Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)*.

o Error Type 3330—Indicates a failure of a diagnostic component on the EI circuit pack. The failed component will not impair service, but it may leave the EI circuit pack in a state where the EI circuit pack cannot detect errors.

1 Replace the EI circuit pack at a time when it is most convenient for the customer (this may cause service outages).

p Error Type 3585—Indicates that the EI circuit pack experienced a series of very short out-of-frame conditions within several minutes. This may indicate transmission difficulties over the fiber link. If this condition ceases, the warning alarm should be resolved within 15 minutes.

1 Enter **display errors** and resolve any SNC-BD, TDM-BUS, TDM-CLK or SYNC errors.

2 Perform the “Fiber Fault Isolation Procedure” described in Chapter 5.

3 If the alarm is not resolved within the next 15 minutes, replace the lightwave transceiver on the EI circuit pack reporting the problem and on the connected EI circuit pack, SNI circuit pack, or DS1 converter circuit pack.

4 If the alarm is not resolved within the next 15 minutes, replace the EI circuit pack reporting the alarm.

5 If the alarm is not resolved within the next 15 minutes, replace the connected EI circuit pack, SNI circuit pack or DS1 converter circuit pack.

q Error Type 3841—Indicates the EI has reported a loss of lock with the backplane system clock.

r Error Type 3842—Indicates that the test that queries the EI for the state of the lock to the system clock has failed. This means that a loss of lock condition is present.

s The counter associated with Error Types 3841 and 3842 is cleared when the query for the state of the clock-to-system-clock passes. Once the alarm is raised, this test is run every five minutes. However, the test is not part of any sequence that can be run on demand. See previous Note “p” for repair procedure.

t Error Type 10001 is a report that the EI circuit pack dropped one control message to the PN. This condition may have been observed as a call that did not complete correctly. No system technician action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in Table 389. For example, by clearing error codes associated with the Expansion Interface Reset test (#336), you may also clear errors generated from other tests in the testing sequence.

Table 389: System Technician-Demanded Tests: EXP-INTF

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Expansion Interface Reset test (#336)			X	D
Expansion Interface Fiber Out-of-Frame Query test (#238)	X	X		ND
Expansion Interface Lightwave Transceiver Looparound test (#242)		X		D
Expansion Interface Control Channel test (#316)	X	X		ND
Expansion Interface Neighbor Query test (#237)	X	X		ND
Expansion Interface Local Looparound test (#240)	X	X		ND
Expansion Interface 2-way Transmission test (#241)	X	X		ND
Expansion Interface Packet Interface test (#589)	X	X		ND

1 D = Destructive, ND = Nondestructive

When testing EI circuit packs to investigate problems, tests should always be run on both circuit packs on the associated fiber link, whether the circuit packs are both EI circuit packs, or one is a SNI circuit pack. This will provide a better indication of where a problem is located.

When testing of the EI is not possible, (for example, when the PN is down), see the previous EI Manual Loop-Back procedure.

Expansion Interface Neighbor Query Test (#237)

This test is **non**destructive.

The Expansion Interface Neighbor Query test is a request to an EI circuit pack to determine whether it has established communication with its neighbor EI or SNI circuit pack.

Table 390: Test #237 Expansion Interface Neighbor Query Test

Error Code	Test Result	Description / Recommendation
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. **1** Issue **list fiber-link** to verify that there is no fiber link administered to this circuit pack. **2** If there is no fiber administered to this circuit pack, but there should be add the correct fiber using **add fiber-link**. **3** Retry the command.
2000	ABORT	Response to the test was not received within the allowable time period.
2031	ABORT	The attempt to send the message to the EI circuit pack, asking it who it's neighbor is, was not successful.
2100	ABORT	System resources required to run this test are not available. Someone may be doing something on this Port Network Interface.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
1033	FAIL	The EI circuit pack under test cannot make contact with its neighbor EI or SNI circuit pack. Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
2027	FAIL	The EI circuit pack has contact with the neighboring EI or SNI circuit pack, but it is the incorrect EI or SNI circuit pack. **1** Enter **list fiber-link** and verify that every fiber link cable is installed as it is administered. **2** Repeat the command.
	PASS	The EI circuit pack has successfully established a link with the neighbor EI or SNI circuit pack. If **status port-network** still indicates that this link is down, one or both of the EI and/or SNI circuit packs may have been busied out. **1** If the link still does not come up, reset one or both EI and/or SNI circuit packs on the link.
0	NO BOARD	No board was detected by the test. **1** Check the error log for wrong board (Error 125) or no board (error 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

Expansion Interface Fiber Out-of-Frame (FOOF) Query Test (#238)

This test is nondestructive. This test is a request to an EI circuit pack to determine whether it is currently detecting the framing sequence on the incoming fiber data stream. If it cannot detect this framing signal, the EI circuit pack will not be able to establish a link with the neighbor EI or SNI circuit pack.

Table 391: Test #238 Expansion Interface Fiber Out-of-Frame Query Test

Error Code	Test Result	Description / Recommendation
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. **1** Issue **list fiber-link** to verify that there is no fiber link administered to this circuit pack. **2** If there is no fiber administered to this circuit pack, but there should be add the correct fiber using **add fiber-link**. **3** Retry the command.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	EI circuit pack could not detect framing sequence. **1** If the EI circuit pack that is failing Test #238 is in the PN, and the red LEDs are ON on a large number of circuit packs, then reseat any Tone-Clock circuit packs in the PN. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. **3** Enter **display errors** and resolve any SNC-BD, TDM-BUS, TDM-CLK, or SYNC errors.
	PASS	The EI circuit pack has detected the valid framing signal on the fiber. **1** Refer to errors from other EI circuit pack, SNI tests, or DS1 converter tests (if present) if the link is still not functioning.
0	NO BOARD	No board was detected by the test. **1** Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

Expansion Interface Local Looparound (#240)

This test is nondestructive. The EI local loop around is similar to the Lightwave Transceiver Looparound test (#242). A test tone is received by the EI being tested, but is not transmitted out to the fiber interface before being looped back. The loop back is internal to the circuit pack. Thus, this test does not interfere with the normal fiber data stream.

Table 392: Test #240 Expansion Interface Local Looparound

Error Code	Test Result	Description / Recommendation
1	ABORT	Could not allocate time slot on TDM Bus A. Loop back passed on TDM Bus B.
2	ABORT	Could not allocate time slot on TDM Bus B. Loop back passed on TDM Bus A. **1** If there is no reason to doubt that the EI circuit pack can transfer data to or from a TDM Bus, then since the test passed on one bus, assume that the test passes on the other bus. **2** If this test continues to abort with the same error, rerun test at 1-minute intervals up to 3 times. **3** If the test still does not pass on the other TDM Bus, follow the procedure for ABORT Error Code 3.
3	ABORT	The system could not allocate time slots for the test on either TDM Bus. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out of service. **1** Enter **display errors** and follow associated repair procedures for TTR-LEV errors in the error log. Even if there are not TTR-LEV errors, there may not be a tone detector available on the network that contains the circuit pack being tested. Verify that there is at least one tone detector on the network. If not, this test always aborts for this EI circuit pack. This does not harm the system. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
1031	ABORT	A query of the EI circuit pack aborted. The purpose of this query was to see if the EI circuit pack could detect the framing signal. **1** If Test #238 aborted, follow the procedure associated with this abort code. **2** If Test #238 did not abort, rerun Test #240 at 1-minute intervals up to 3 times.

Table 392: Test #240 Expansion Interface Local Looparound

Error Code	Test Result	Description / Recommendation
1032	ABORT	The EI cannot detect the framing signal and cannot run the test. **1** Refer to the errors for Test #238 to determine why the EI circuit pack is out of frame.
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. **1** Issue the **list fiber-link** command to verify that there is no fiber link administered to this circuit pack. **2** If there is no fiber administered to this circuit pack, but there should be add the correct fiber using the **add fiber-link** command. **3** Retry the command.
1394	ABORT	The EI circuit pack is out of service and the test cannot be run. This condition is due to a change in the EI circuit pack's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. **1** Run Test #237, and check the Error Log for EXP-INTF error type 1281. If error type 1281 is present or if Test #237 does not pass, see repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932.
1395	ABORT	This test cannot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. **1** If this test needs to run on this EI circuit pack, enable PNC with the **change system-parameters duplication** command. **2** Prevent the system from doing a PNC interchange by executing the **set pnc lock** command. **3** Repeat this test.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 392: Test #240 Expansion Interface Local Looparound

Error Code	Test Result	Description / Recommendation
1	FAIL	Loop back on TDM Bus A failed. Loop back on TDM Bus B passed.
2	FAIL	Loop back on TDM Bus B failed. Loop back on TDM Bus A passed.
3	FAIL	Loop back on both TDM Buses failed.
12	FAIL	Loop back on TDM Bus B failed. Loop back on TDM Bus A aborted because the system could not allocate time slots.
21	FAIL	Loop back on TDM Bus A failed. Loop back on TDM Bus B aborted because the system could not allocate time slots.
None	FAIL	The test tone was not detected correctly after being looped through the EI circuit pack. **1** If Error Type 2305 has been logged against the EI circuit pack in the last 5 minutes, this test could have failed due to the associated slips. If so, first resolve the 2305 error, and then repeat the test. **2** Run the tests for the active Tone-Clock on the PN that contains the indicted EI circuit pack to verify that dial-tone is supplied. **3** If the tone-clock is healthy, repeat the short test on the EI board. **4** If this test continues to fail, replace the EI circuit pack.
	PASS	Test tone was correctly detected after internal EI loop back on both TDM buses. **1** Refer to other EI circuit pack tests if the links between this EI circuit pack and the EI or SNI circuit pack on the other end of the fiber is not functioning correctly.
0	NO BOARD	No board was detected by the test. **1** Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board *UUCSS*** command. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Expansion Interface 2-Way Transmission Test (#241)

This test is nondestructive. The EI 2-way transmission test is a basic connectivity test between two PNs. The test first sends dialtone from the cabinet of the EI circuit pack under test through the Center Stage Switch, through the DS1 converter circuit packs, and through another EI circuit pack to a tone detector in the other cabinet. The connections are then reversed and the tone is passed in the opposite direction. If the system is equipped with a Center Stage Switch, and this test either fails or aborts with the above connection, a second PN is chosen (if one is available and the EI circuit pack is In-Service) and the same

test is run on this new connection. This helps in the isolation of the fault. Since two EI circuit packs are involved in the connection, either one of them could be at fault and this repeated test can help determine which one is actually at fault.

The path used in this test is represented in Figure 66, Two-Way Circuit Switch Transmission Test, on page 937.

Figure 66: Two-Way Circuit Switch Transmission Test

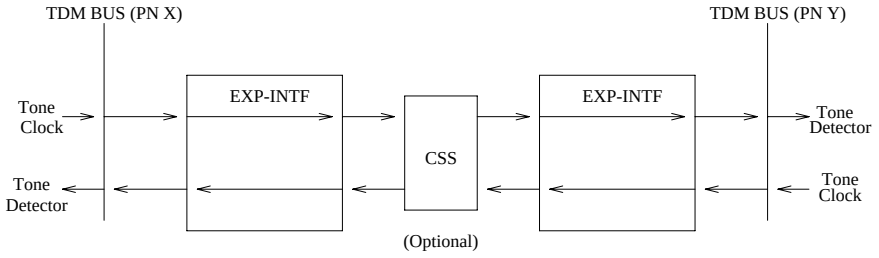

Table 393: Test #241 Expansion Interface 2-Way Transmission Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. Enter **display errors** and follow the repair procedures for TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out of service. **1** Enter **display errors** and follow the repair procedures for TTR-LEV errors in the error log. Even if there are not TTR-LEV errors, there may not be a tone detector available on the network that contains the circuit pack being tested. Verify that there is at least one tone detector on this network. If not, this test will always abort for this EI circuit pack. This will not harm the system in any way. S8700 Multi-Connect systems require that Tone Detector circuit packs (TN768) must be of vintage "B" or newer. If older Tone Detector circuit packs are installed in the system, this test will always abort with this code. **2** Enter **display errors** and follow the repair procedures for TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.

Table 393: Test #241 Expansion Interface 2-Way Transmission Test

Error Code	Test Result	Description / Recommendation
1033	ABORT	The test cannot run because either the EI board does not have a fiber link administered to it and there is not sufficient data to run the test, or there were no other PNs administered that had its EI board In-Service. **1** Check fiber administration to insure that there is a fiber link administered to this EI circuit pack. **2** If there is a fiber administered to this EI circuit pack, then some change in the status of the ability of the EI circuit pack in the other PNs to communicate with the EI or SNI circuit pack on the other end of its fiber has occurred. **3** Test #237 and check for EXP-INTF circuit pack Error Type 1281 in the Error Log for the EI circuit packs in these other PNs. If Error Type 1281 is present and/or Test #237 does not pass, see repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932. **4** If Test #237 passes, reseat the EI circuit pack. This is not destructive since the circuit pack cannot be serving as the Expansion Archangel if it is not in service.
1394	ABORT	The EI circuit pack is out of service and the test cannot be run. This condition is due to a change in the EI circuit pack's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. **1** Run Test #237, and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 fails, see repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932.
1395	ABORT	This test cannot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. **1** If this test needs to run on this EI circuit pack, enable PNC with the **change system-parameters duplication** command. **2** Prevent the system from doing a PNC interchange by executing the **set pnc lock** command. **3** Repeat this test.
1413	ABORT	This test requires the use of a Tone-Clock circuit pack in each of the PNs used in this test. This abort code indicates that there are none of these circuit packs located in one of the PNs. **1** Verify that there is a Tone-Clock circuit pack in the PN where the EI circuit pack under test resides. **2** In a Direct Connect configuration, verify that there is a Tone-Clock circuit pack in the PN where the neighbor EIEI circuit pack circuit pack resides. **3** In a Center Stage Switch configuration, verify that there is at least one other PN, besides the PN where the EI circuit pack under test resides, with a Tone-Clock circuit pack.

Table 393: Test #241 Expansion Interface 2-Way Transmission Test

Error Code	Test Result	Description / Recommendation
1414	ABORT	This test requires the use of an active Tone-Clock circuit pack in each of the PNs used in this test that does not have a MAJOR or MINOR alarm logged against it. This abort code indicates that the active Tone-Clock circuit pack in one of the PNs being used for the test has a MAJOR or MINOR alarm logged against it. **1** Enter **display alarms** and resolve every TONE-BD and TONE-PT alarm.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	The test tone was not detected correctly in either direction. **1** Run the test for the active Tone-Clocks on the PNs for which the EI circuit pack under test provides a link. This will determine whether dial tone is being supplied. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
1 or 2	FAIL	The test tone was detected correctly in one direction, but not the opposite direction. **1** Test for the active Tone-Clocks on the PNs for which the defective EI board provides a link. This determines if the dial tone is supplied. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. **Center Stage:** These failure codes are possible on a Center Stage Switch configuration only when there is just one other PN available for looping back the test tone. **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
3 or 4	FAIL	The failure codes only apply to a system equipped with a Center Stage Switch. They indicate that the test aborted or failed for the first connection from the EI board under test to another PN, and that the test tone was detected correctly in one direction, but not the opposite direction when the connection was between the EI board under test and a different PN than was used in the first connection. **1** Run the test for the active Tone-Clocks on the PNs for which the defective EI board provides a link. This determines if the dial tone is being supplied. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
	PASS	The tone was successfully transmitted in both directions. Both EI boards, SNI boards, DS1 converter circuit packs, and their lightwave transceivers are functioning properly.

Table 393: Test #241 Expansion Interface 2-Way Transmission Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. **1** Check the error log for wrong board (error 125) or no board (error 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board *UUCSS*** command. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Expansion Interface Lightwave Transceiver Loop-Around Test (#242)

This test is **destructive**.

This test requires that the EI circuit pack first be busied out. If the system has a duplicated Port Network Connectivity, this test cannot be run on an EI circuit pack that resides on the current active PNC due to restrictions that prohibit the busying-out of certain components that are part of the active PNC. If this test is run on an EI circuit pack that is part of the standby PNC, this test is not destructive and no service outages will take place.

In a system without duplicated Port Network Connectivity, where this EI circuit supports an IPSI to PN link, this test will disrupt service to one or more PN's. If the EI circuit pack is part of a PN-to-PN link in a Direct Connect system, service between the two PNs will be disrupted.

This is a 2-part connectivity test. In the first part of the test, a digital count is transmitted from the cabinet of the EI circuit pack under test, through the EI circuit pack under test, out to its lightwave transceiver. The connection then loops back into the lightwave transceiver, through the same EI circuit pack again, and into the originating cabinet. If the test tone is detected by a tone detector, the first part of the test passes. The path used for this part of the test is represented in Figure 67, TDM BUS Lightwave Transceiver Looparound, on page 941.

In the second part of the test, a data packet is sent from the TN1655 Packet Interface circuit pack to the EI circuit pack under test, the packet is looped back through the lightwave transceiver and is sent back to the Packet Interface circuit pack. If the Packet Interface circuit pack receives the same packet it transmitted, the second part of the test passes. If the entire test has passed, the EI circuit pack, its backplane wiring, and the electrical portion of the lightwave transceiver are healthy. The path used for this test is represented in Figure 68, Packet Bus Lightwave Transceiver Looparound—PN only, on page 941. The path used for this test if the EI resides in a PN is represented in Figure 69, Packet Bus Lightwave Transceiver Looparound—PN only, on page 942.

When the EI circuit pack under test is in a PN, the data packet must also pass through the active EI circuit packs and the active DS1 converter circuit packs (and the active SNI circuit pack(s) in a Center Stage Switch system) of the active PNC link connecting the PN.

This test requires the EI circuit pack to ignore incoming data from its neighbor EI circuit pack or SNI circuit pack. Thus this test will:

- Disturb any inter-PN connections that currently exist over the link provided by the EI under test and its neighbor
- Disrupt signaling between the two circuit packs

Figure 67: TDM BUS Lightwave Transceiver Looparound

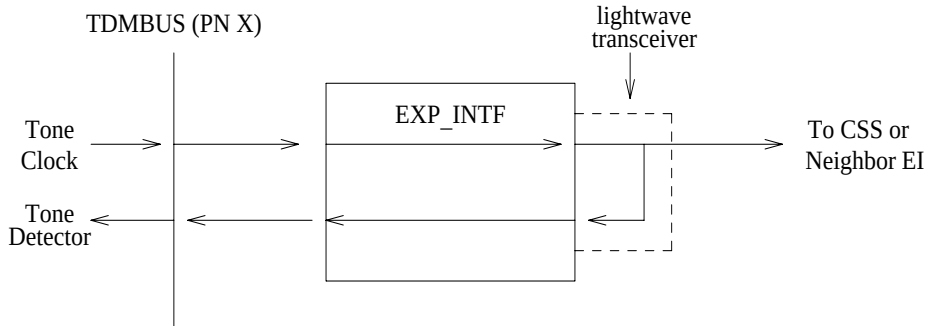

Figure 68: Packet Bus Lightwave Transceiver Looparound—PN only

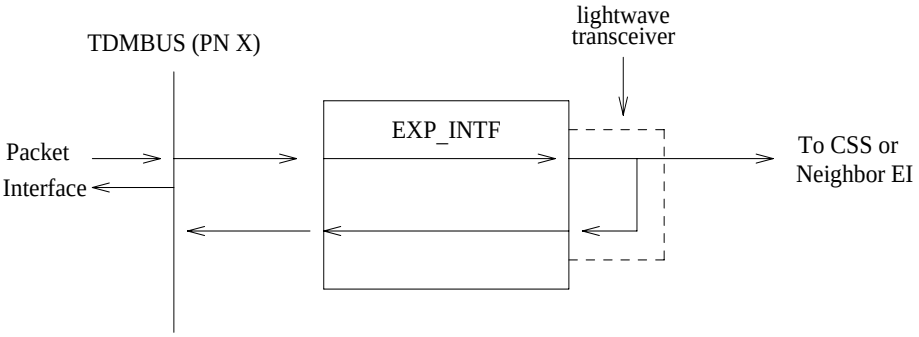

Figure 69: Packet Bus Lightwave Transceiver Looparound—PN only

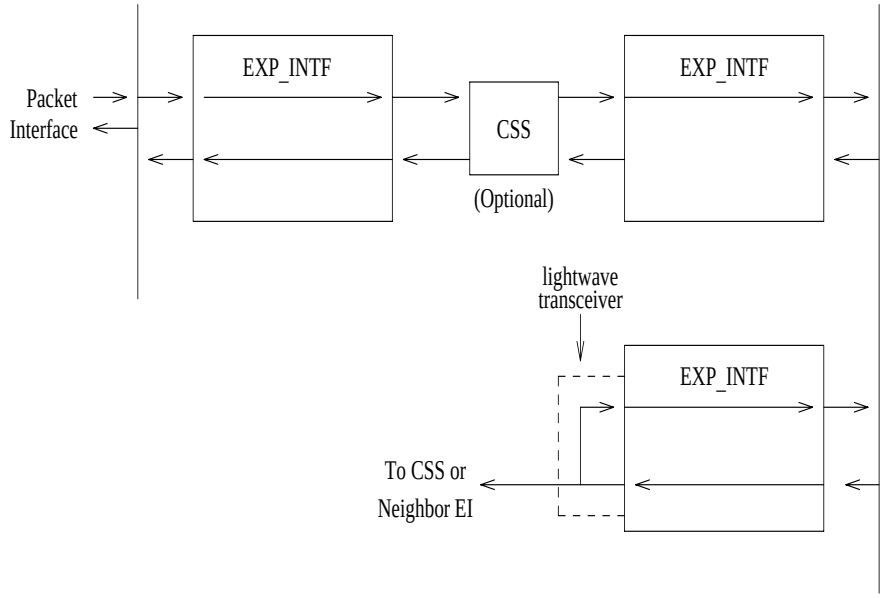

Table 394: Test #242 Expansion Interface Lightwave Transceiver Looparound

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions, or it may have timeslots out of service due to TDM-BUS errors. Enter **display errors** and resolve any TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out of service. **1** Enter **display errors** and follow associated repair procedures for TTR-LEV. Even if there are no TTR-LEV errors, there may not be a Tone Detector available on the network that contains the circuit pack being tested. Verify that there is at least one Tone Detector on this network. If there is not at least one Tone Detector, this test always aborts for this EI board. This will not harm the system. **2** Enter **display errors** and follow associated repair procedures for TONE-PT. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
1015	ABORT	The system will not allow this test to be run because the EI circuit pack has not been busied out. **1** Busyout the EI circuit pack. Repeat **test board *UUCSS* long**.

Table 394: Test #242 Expansion Interface Lightwave Transceiver Looparound

Error Code	Test Result	Description / Recommendation
1031	ABORT	If the EI circuit pack is in a PN and is on the active PNC, and is not part of a PN-to-PN link, this test *cannot* be executed. If the lightwave transceiver looparound is activated, it is impossible to deactivate it. **1** If PNC Duplication is enabled, attempt to make the standby PNC active through the **reset pnc interchange** command. **2** If the PNC Interchange is successful, the Lightwave Transceiver Looparound test may now be executed on the original EI circuit pack.
1033	ABORT	The test cannot run because the EI circuit pack does not have a fiber link administered to it and there is not sufficient data to run the test. **1** Issue **list fiber-link** to verify that there is no fiber link administered to this circuit pack. **2** If there is no fiber administered to this circuit pack (but should be), add the correct fiber using **add fiber-link**. **3** Retry the command.
1139	ABORT	The packet bus in the PN where this EI board resides has a major alarm against it. This test needs to use the alarmed PN's packet bus. **1** Enter **display alarms** and **display errors** and resolve any PKT-BUS alarms. **2** Retry the command.
1141	ABORT	The Packet Interface circuit pack is out of service. **1** See PKT-INT (Packet Interface) on page 1421.
1144	ABORT	The PN's packet bus has a major alarm against it. This test needs to use the alarmed PN's packet bus. **1** Enter **display alarms** and **display errors** and resolve any PKT-BUS alarms. **2** Retry the command.
1394	ABORT	The EI board is out of service and the test cannot be run. This condition is due to a change in the EI board's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. **1** Run Test #237 and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 fails, see repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932.
1395	ABORT	This test cannot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. **1** If this test needs to run on this EI circuit pack, enable PNC with **change system-parameters duplication**. **2** Prevent the system from doing a PNC interchange by executing the **set pnc lock** command. **3** Repeat this test.

Table 394: Test #242 Expansion Interface Lightwave Transceiver Looparound

Error Code	Test Result	Description / Recommendation
1407	ABORT	This test cannot be run on an EI board that is on the active PNC because it cannot be busied out. This error code indicates that PNC duplication is enabled. **1** Attempt to perform a PNC interchange via **reset pnc interchange**. **2** If the PNC interchange is successful, busyout the original EI circuit pack via **busyout board *UUCSS*** (address of the original EI board). **3** Retry the command.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2060	ABORT	The link on the packet bus being used to perform the test has failed. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continue to abort, enter **display errors** and resolve any PKT-INT errors.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
1	FAIL	The test did not detect the test tone through the loop-around connection. The packet portion of this test was not run since the circuit portion failed. **1** Test the active Tone-Clock on the PN that contains the defective EI circuit pack to verify that dial tone is being supplied. **2** If the Tone-Clock is healthy, issue **test board *UUCSS* long** on the EI circuit pack. **3** If this test continues to fail, replace the EI circuit pack or transceiver. Then reissue **test board *UUCSS* long** on the new EI circuit pack.
2	FAIL	The test tone was transmitted and detected correctly, but the correct data packet was not detected by the TN1655 Packet Interface circuit pack. **1** Test the TN1655 Packet Interface circuit pack to verify that it is functioning properly. If any tests fail, investigate those tests and repair the Packet Interface circuit pack. **2** If the Packet Interface circuit pack checks out OK, enter **display errors** and **display alarms** and resolve any SNI-BD and FIBER-LK alarms or errors (Center Stage Switch only) and DS1C-BD alarms or errors (if present). **3** Issue **test board *UUCSS* long** on the EI board. **4** If Test #242 continues to fail, replace the EI board. Then issue **test board *UUCSS* long** on the new EI board. **5** If Test #242 continues to fail, replace the lightwave transceiver, reset the circuit pack and issue **test board *UUCSS* long** on the EI circuit pack.

Table 394: Test #242 Expansion Interface Lightwave Transceiver Looparound

Error Code	Test Result	Description / Recommendation
	PASS	When this test (#242) and the EI Local Looparound test (#240) pass, this indicates that the EI board is functioning properly, but it does not verify that the optical portion of the lightwave transceiver is functioning. **1** Issue **test board *UUCSS*** on the EI board on both ends of fiber. If this test passes from both sides, but other tests fail, such as #241, this condition indicates either a faulty lightwave transceiver or the fiber itself has failed. To determine whether a lightwave transceiver or the fiber itself has failed, execute the EI Manual Loop-Back procedure described in a previous section. Test #242 can only be run from both EIs if they are the standby pair and the active pair is working properly. **2** If this EI board is failing other tests, execute the EI Manual Loop-Back Test. **3** If problems still exist after the EI Manual Loop-Back Procedure indicates both EI boards and both lightwave transceivers are healthy, manually check out the building fiber. Verify that each optical fiber connects to a transmitter at one end and a receiver at the other.
0	NO BOARD	No board was detected by the test. **1** Check the error log for wrong board (Error 125) or no board (Error 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Expansion Interface Control Channel Test (#316)

This test is nondestructive. If an EI circuit pack is a standby EI circuit pack (amber LED off) or if the EI is active in the PN (amber LED on), this test queries the EI circuit pack for its circuit pack type and vintage information. If the EI circuit pack is an active EI circuit pack in the PN (amber LED on long off short) the Expansion Interface Control Channel test checks to see if the EI circuit pack can communicate with other circuit packs in the PN using the PN TDM bus.

Table 395: Test #316 Expansion Interface Control Channel Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 395: Test #316 Expansion Interface Control Channel Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The EI circuit pack responded incorrectly or if it is the PN active EI circuit pack, it could not talk to PN circuit packs. **1** If the active EI circuit pack in the PN is failing and duplicated PNC is enabled, attempt to switch to the standby PNC using **reset PNC interchange**. **2** Repeat the short test sequence. **3** If test continues to fail, reset the EI circuit pack via the **reset board *UUCSS*** command. **4** If the EI circuit pack in the PN is failing, enter **display errors** and **display alarms**, and resolve any TDM-CLK, TONE-BD, or SYNC alarms or errors. **5** Repeat the short test sequence. **6** If test continues to fail, replace the circuit pack or transceiver.
	PASS	The EI circuit pack did respond correctly to test. Communication from software to the EI circuit pack is functioning. **1** Refer to other EI circuit pack tests if the link is not functioning correctly.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Expansion Interface Reset Test (#336)

This test is **destructive**.

This test is potentially very destructive and requires the EI circuit pack to be busied out prior to execution of this test.

The Expansion Interface Reset test, which is not part of either the Short or the Long test sequences test, is executed via the **reset board *UUCSS*** command where UUCSS is the address of the EI circuit pack to be reset.

If the system does not have duplicated PNC, and is a Direct Connect system, and one of the EI circuit packs must be reset, the action of busying out the desired EI circuit pack will deny calls to the PN until the EI circuit pack is released from the busyout state. If the EI circuit pack is part of a PN-to-PN link, new connections to the PN will be denied. If the EI circuit pack is part of a PN-to-PN link, calls between the two PNs will be denied.

In a non-duplicated PNC system with a Center Stage Switch, if the EI circuit pack in the PN is busied out, new service to that PN only will be denied. However, if the EI circuit pack resides in the PN, new service to every PN will be denied until the EI circuit pack is released from the busyout state.

If the system does not have duplicated PNC, the reset of any EI is allowed, but it will result in the resetting of every PN board and loss of service to the PN(s) for a few minutes.

If the system does have duplicated PNC, and the EI circuit pack to be reset is part of the active PNC, the system will not allow the busyout and the system technician will be required to interchange the PNCs via the **reset pnc interchange** command. After executing the PNC interchange, it will be possible to busyout and then reset the original EI circuit pack.

If the PN's Maintenance (MAINT) circuit pack determines that the EI (EXP-INTF) circuit pack is cycling between sane and insane several times within several minutes, MAINT may inhibit operation of the EXP-INTF by holding the EI circuit pack in a reset state. This condition may result in an unsuccessful reset of the EI circuit pack.

If the reset command returns "PN is unavailable," execute the following steps:

1. Use the **change circuit-pack P** (PN's number) command.
2. For the EI circuit pack you wish to reset, add an entry to the Circuit Pack screen for the TN570 EI circuit pack. Be sure to enter the appropriate carrier and slot.
3. Enter the screen.
4. Issue the **busyout board *UUCSS*** command.
5. Repeat the **reset board** command

Table 396: Test #336 Expansion Interface Reset Test

Error Code	Test Result	Description / Recommendation
4	ABORT	Could not reset the PN EI circuit pack over the optical fiber since the neighbor EI circuit pack or SNI circuit pack is not recognized by software (inserted). **1** Insert neighbor EI circuit pack or SNI circuit pack and perform reset again.
1015	ABORT	The system will not allow this test to be run because the EI circuit pack has not been busied out. Busyout the EI circuit pack. Enter **reset board *UUCSS***.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 396: Test #336 Expansion Interface Reset Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The EI did not successfully reset. **1** If the EI circuit pack is in the PN, the PN's Maintenance board may be holding the EI circuit pack reset. Attempt to rectify this condition by executing **test maint *P* long** on the Maintenance board in the same PN. **2** If step 1 was not successful in releasing the EI circuit pack, temporarily remove the PN's Maintenance circuit pack. **3** Repeat the **reset board *UUCSS*** command. **4** If reset continues to fail, replace circuit pack. **5** Insert PN's Maintenance circuit pack if it was removed.
2	FAIL	The EI circuit pack was successfully reset, but it did not begin running after the reset. **1** If the EI circuit pack is in the PN, temporarily remove the PN's Maintenance circuit pack. **2** Use **reset board *UUCSS***. **3** Reinsert the PN's Maintenance circuit pack if it was removed.
3	FAIL	The reset over the optical fiber failed. **1** Execute the **test board *UUCSS*** command on the PN neighbor EI circuit pack located on the opposite end of the fiber from this EI circuit pack. If Test #238 fails, follow the maintenance procedure associated with this test result. Then perform the reset again. **2** If the EI circuit pack is in the PN, temporarily remove the PN's Maintenance circuit pack. **3** Repeat the **reset board *UUCSS*** command. **4** Reinsert PN's Maintenance circuit pack if it was removed. **5** If the symptoms match those described in the "EI and Tone-Clock Interactions" section, follow those guidelines. **6** Check the Error Log for the PN Tone-Clock errors that were resolved when the PN went down. These errors may have been resolved BECAUSE the PN went down. When there is no Tone-Clock generating the system clock on a PN, then an EI circuit pack can only be reset once. Every subsequent reset attempt fails. It is also possible that the system itself may have already tried to reset the EI circuit pack. Refer to TONE-BD (Tone-Clock Circuit) on page 1902 for Tone-Clock problems. **7** If the reset still fails, execute the Manual Loop Back Procedure on the opposite PN EI circuit pack. This procedure is described in the section preceding the Error Log Entries and Test to Clear Values table for this MO. If the EI circuit pack and the lightwave transceiver are healthy, the problem is the EI circuit pack and its lightwave transceiver on the PN end of the fiber or the fiber itself. Test the PN EI circuit pack with the manual loop back procedure and investigate the test results.

Table 396: Test #336 Expansion Interface Reset Test

Error Code	Test Result	Description / Recommendation
	PASS	The EI was successfully reset. Remove the EI circuit pack from the busyout state by using the **release board *UUCSS*** command. **1** Execute **test board *UUCSS* short** command. Refer to errors for each test.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (error 125) or no board (error 131) issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (error 1538). If hyperactive, use the **reset board *UUCSS*** command. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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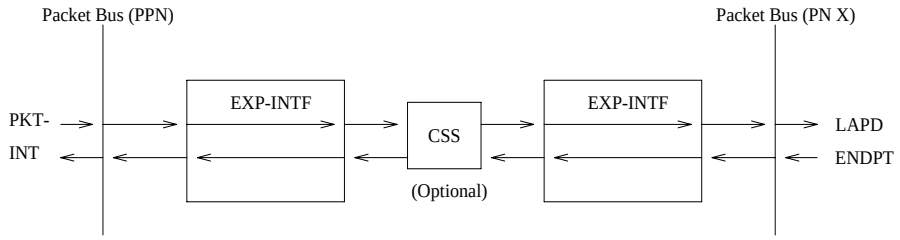
Expansion Interface Packet Interface Test (#589)

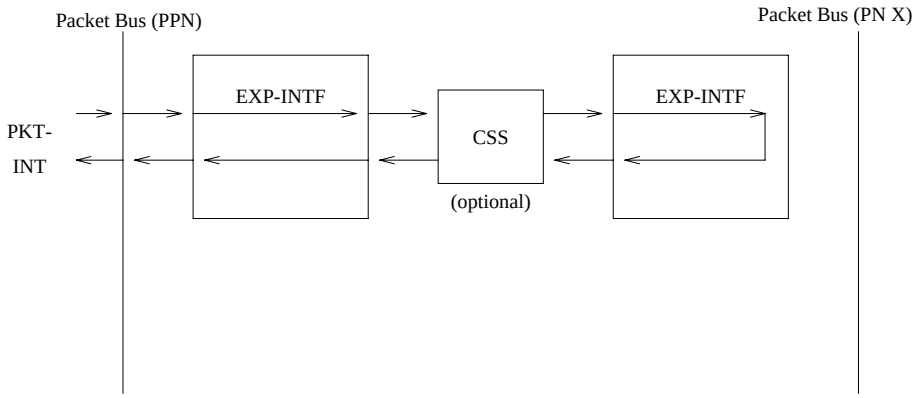
This test is nondestructive. This test attempts to send a data packet from the TN1655 Packet Interface circuit pack through any intervening EI circuit packs and/or SNI circuit packs and through the EI circuit pack to be tested. The path the data packet takes is dependent on the location of the EI circuit pack to be tested and whether the system has duplicated PNC. The following diagrams and short discussion of each describe the different paths the test uses.

Figure 70: Expansion Interface Packet Interface Test—Packet Endpoint Loop



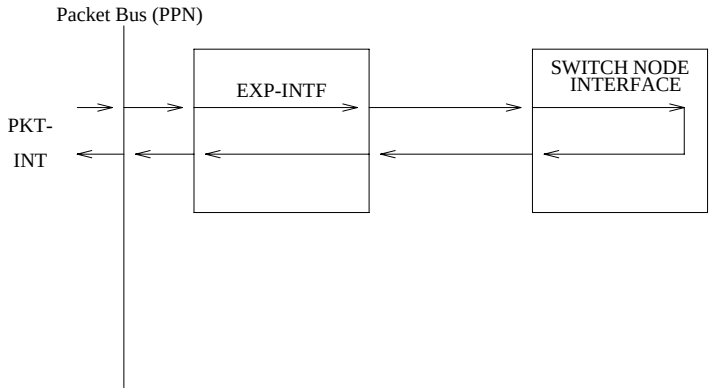
The path shown in Figure 70, Expansion Interface Packet Interface Test—Packet Endpoint Loop, on page 949 is used when testing a PN EI that is on the active PNC.

Figure 71: Expansion Interface Packet Interface Test — PN-to-PN loop



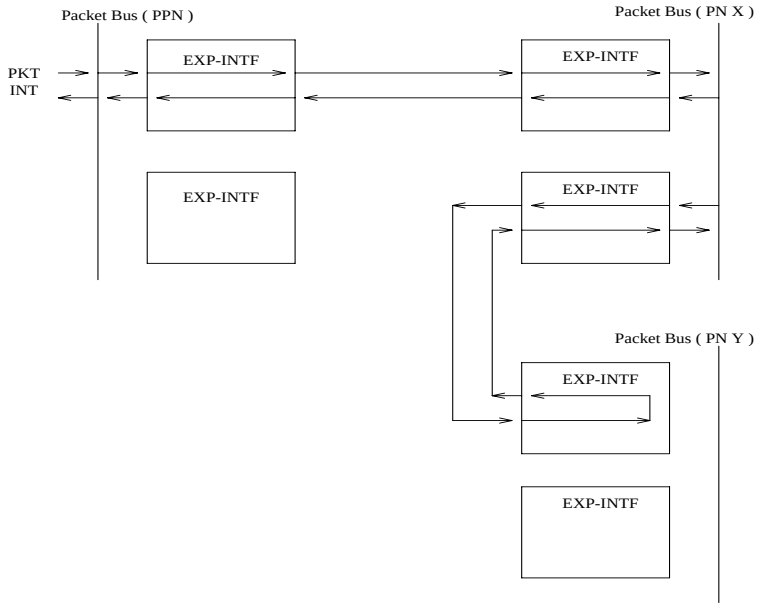
In a Center Stage configuration the path shown in Figure 71, Expansion Interface Packet Interface Test — PN-to-PN loop, on page 950 is used when testing a PN EI that is on the standby PNC. In a Direct Connect configuration, this path is used on any PN EI or on a PN EI that is on the standby PNC.

Figure 72: Expansion Interface Packet Interface Test—PN to CSS Loop



The path shown in Figure 72, Expansion Interface Packet Interface Test—PN to CSS Loop, on page 950 is used when running the test on a PN EI in a Center Stage configuration.

Figure 73: Expansion Interface Packet Interface Test — PN-to-PN link



The path shown in Figure 73, Expansion Interface Packet Interface Test — PN-to-PN link, on page 951 is used when the EI under test is one that provides connectivity between the two PNs in a Direct Connect configuration.

Table 397: Test #589 Expansion Interface Packet Interface Test

Error Code	Test Result	Description / Recommendation
1033	ABORT	The test cannot run because the EI circuit pack does not have a fiber link administered to it and there is not sufficient data to run the test or because EI circuit packs on other port networks needed for this test are out of service. **1** Execute **list fiber-link** and determine whether the EI circuit pack under test is an endpoint of one of the administered fiber links. If so, then proceed to step 2. If not, then this is considered to be a spare board, and the test should not be attempted on this EI circuit pack. **2** Follow procedures for applicable configuration: **Direct Connect:** **1** Issue **list config** for the cabinet and carrier where the neighbor EI circuit pack resides. If the results reveal that the board is not recognized by software, the board is out of service because of this condition. Perform the following steps: **a** If this test is being executed on an EI circuit pack located in the PN, enter **display errors** and resolve any EXP-PN errors for the port network where the neighbor EI circuit pack resides. Re-execute this test. **b** If this test continues to abort with this abort code reset the DS1 converter circuit pack (if so equipped) or the neighbor EI circuit pack. This will not be destructive since the circuit pack cannot be serving as the Expansion Archangel if it is not in service. **2** Run Test #237 and check for EXP-INTF circuit pack Error Type 1281 in the Error Log. If Error Type 1281 is present and/or Test #237 does not pass, see repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932. **3** If Test #237 passes, reseat the EI circuit pack. This will not be destructive since the circuit pack cannot be serving as the Expansion Archangel if it is not in service. **4** Repeat Test #237. **Center Stage:** *If the EI circuit pack under test resides in the PN:* None of the EI circuit packs located in the PNs (on the same PNC side) are in service (for PN EIs see the next case). **1** Issue **list fiber-link** to determine whether any of the PN's EI circuit packs are administered as endpoints of a fiber link. If not, then ignore the results of this test. **2** Issue **list conf** for the cabinets and carriers where the EI circuit packs reside in every other PN. If the results returned indicated that the circuit packs are not recognized by software, they are out of service for this reason.

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Table 397: Test #589 Expansion Interface Packet Interface Test

Error Code	Test Result	Description / Recommendation
1033 *(cont'd.)*	ABORT *(cont'd.)*	**3** Issue the **display errors** command, and resolve any EXP-PN errors. Re-execute this test. **4** If the test continues to abort with this error code, reseat the EI circuit packs (or DS1 converter circuit pack if so equipped) on the PNs. This will not be destructive since the circuit pack cannot be serving as the Expansion Archangel if it is not in service. **5** Run Test #237 on each of the PN EI circuit packs, and check for EXP-INTF circuit pack Error Type 1281 in the error log. If Error Type is present and/or Test #237 does not pass, see repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932. **6** Repeat this test. *If the EI circuit pack under test resides in the PN:* The EI circuit located in the PN is out of service. **1** Run Test #237 on each of the PN EI circuit packs and check for EXP-INTF circuit pack Error Type 1281 in the error log. If Error Type is present and/or Test #237 does not pass, see repair procedures for Test #237, on page 932. **2** Repeat this test.
1139	ABORT	The packet bus in the PN where this EI circuit pack resides has a major alarm against it. This test needs to use the alarmed port network's packet bus. **1** Enter **display alarms** and resolve any PKT-BUS alarms. **2** Retry the command.
1141	ABORT	The Packet Interface circuit pack is out of service. **1** See PKT-INT (Packet Interface) on page 1421 for the recommended repair procedure.
1144	ABORT	The PN's packet bus has a major alarm against it. This test needs to use the alarmed PN's packet bus. **1** Enter **display alarms** and resolve any PKT-BUS alarms. **2** Retry the command.

Table 397: Test #589 Expansion Interface Packet Interface Test

Error Code	Test Result	Description / Recommendation
1394	ABORT	The EI circuit pack is out of service and the test cannot be run. This condition is due to a change in the EI circuit pack's ability to communicate with the EI or SNI circuit pack on the other end of the fiber. **1** Run Test #237 and check the Error Log for EXP-INTF Error Type 1281. If Error Type 1281 is present or if Test #237 does not pass, see the repair procedures for Test #237, in Table 390, Test #237 Expansion Interface Neighbor Query Test, on page 932. **2** If Test #237 passes, rest the EI pack. Note that this will not be destructive to the port network where EI circuit pack resides because it will not be serving as the expansion Archangel if it is not in service. **3** Repeat this test.
1395	ABORT	This test cannot be run on an EI circuit pack if it is part of the B-side PNC and duplicated PNC is not enabled. **1** If this test needs to run on this EI circuit pack, enable PNC with the **change system-parameters duplication** command. **2** Prevent the system from doing a PNC interchange by executing the **set pnc lock** command. **3** Repeat this test.
1421	ABORT	This abort code appears only when the EI circuit pack addressed in the test command is one that terminates a fiber link between two PNs in a direct connect system. It indicates that the test failed, but that this test was run on the PN EI board that is: a) in the same PN as the board under test b) on the active PNC (if duplicated) c) terminates the fiber from the PN The EI tested is probably not at fault. **1** Enter **display alarms** and follow the EXP-INTF repair procedures for any alarms against the PN EI that is: **a** In the same PN as the board just tested **b** On the active PNC **c** Terminates the fiber link from the PN **2** If there are no alarms logged against that EI, run Test #589 on it and follow procedures for this test. **3** Try this command again.

Table 397: Test #589 Expansion Interface Packet Interface Test

Error Code	Test Result	Description / Recommendation
1422	ABORT	This abort code is valid and will only appear when the EI circuit pack under test resides in a PN of a system with a Center Stage Switch configuration. It means that the test failed, but that this test was then run on the PN EI on the same PNC as the EI under test and that test failed. This means that the EI originally tested is probably not at fault. **1** Resolve any alarms that are logged against the PN EI that is on the same PNC as the EI under test. **2** If there are no alarms logged against the PN EI, run Test #589 against the PN EI and follow procedures for this test. **3** Try this command again.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2060	ABORT	The link on the packet bus being used to perform the test has failed. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort, enter **display errors** and resolve any PKT-INT errors.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
ANY	FAIL	The transmitted data packet was not received correctly by the Packet Interface circuit pack. The failure may be in the EI under test, the DS1 converter circuit packs, or the intervening Center Stage components. **1** Test the Packet Interface circuit with the **test packet-interface *CS*** command where "C" is the IPSI's carrier in a high- or critical-reliability system, and "S" is the slot number where the IPSI's Packet Interface resides. If the Packet Interface circuit fails any tests, seePKT-INT (Packet Interface) on page 1421. **2** If the EI under test resides in a high-reliability system's PN, (2 PN-to-CSS fibers in an unduplicated PNC), run the short test sequence on both of the PN's EI boards, and follow procedures for Test #589. **3** Enter **display errors** and resolve any PKT-BUS errors. **4** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
	PASS	Although this test has passed, there may be related problems on other EIs used in connectivity to and from this EI. Software may have conducted tests on these other components and determined that this board was functioning properly and any problems were probably due to a problem with some other connectivity component. Check the error and alarm logs for problems with other EI circuit packs and resolve these errors. **1** Refer to other EI board tests if the link is not functioning correctly.

Table 397: Test #589 Expansion Interface Packet Interface Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board *UUCSS*** command. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Expansion Interface Test (#244)

This test is potentially very **destructive** and requires the EI circuit pack to be **busied out** prior to execution of this test.

The Expansion Interface test, which is not a part of either the short or long test sequences, is executed via the **reset board *PCSS*** command where PCSS is the address of the EI circuit pack to be reset.

If the system only has one working EI link between a pair of port networks and one of the EI circuit packs must be reset, the action of busying out the desired EI circuit pack WILL DISRUPT SERVICE TO THE PN until the circuit pack is released from the busyout state. If the circuit pack is part of a PN-to-PN link, the PN WILL BE WITHOUT SERVICE. If the circuit pack is part of a PN-to-PN link CALLS BETWEEN THE TWO PNs WILL BE DENIED.

If the system has working duplicate EI links, and the EI circuit pack to be reset is part of the active EI link, the system does not allow the busyout and instructs system technician to switch EI links via the **set expansion-link *PCSS*** command where PCSS is the address of either standby EI circuit pack on the standby link. After executing the EI link switch, it is possible to busyout and then reset the original EI circuit pack.

However, if the PN's Maintenance (MAINT) circuit pack determines that the EI (EXP-INTF) circuit pack is cycling between sane and insane several times within several minutes, MAINT may inhibit operation of the EXP-INTF by holding the EI circuit pack in a reset state. This condition may result in an unsuccessful reset of the EI circuit pack.

If the reset command returns with `PN is unavailable`, execute the following:

1. Use the **change circuit-pack *P*** (PN's number) command.
2. For the EI circuit pack you wish to reset, add an entry to the Circuit Pack screen for the TN776 EI circuit pack. Be sure to enter the appropriate carrier and slot (that is, A01 or B02).
3. Repeat the **reset board** command.

Table 398: Test #224 Expansion Interface Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
4	ABORT	Could not reset PN EI circuit pack over optical fiber since PN EI circuit pack on opposite end of fiber is not inserted. **1** Insert opposite EI circuit pack and perform reset again.
1015	ABORT	The system does not allow this test to be run because the EI circuit pack has not been busied out. **1** Busyout the EI circuit pack. Enter **reset board *PCSS***.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.
9999	ABORT	EI circuit pack reset successfully. Could not perform initialization test results query because link to PN is not up. **1** Execute **release board *PCSS***. Wait one minute. Issue **display error**. If you see Error Type 2049 logged against this EI circuit pack, then the EI Test has failed with an error code equal to the aux data of this entry. Otherwise, the initialization tests have passed.
12000	ABORT	EI circuit pack reset successfully. Response to the initialization test results query was not received within the allowable time period.
12100	ABORT	EI circuit pack reset successfully. System resources required to run initialization test are not available. **1** Retry the command at 1-minute intervals up to 3 times.
12026	ABORT	EI circuit pack reset successfully. It responded with an unknown reply to the query for the results of its initialization tests. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort, replace the circuit pack or transceiver.
1	FAIL	The EI did not successfully reset. **1** If the EI circuit pack is in the PN, the PN's Maintenance board may be holding the EI circuit pack reset. Attempt to rectify this condition by executing **test maint *P* long** on the Maintenance board in the same PN. **2** If step 1 was not successful in releasing the EI circuit pack, temporarily remove the PN's Maintenance circuit pack. **3** Enter **reset board *PCSS***. **4** If reset continues to fail, replace circuit pack. **5** Insert PN's Maintenance circuit pack if it was removed.

Table 398: Test #224 Expansion Interface Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The EI circuit pack was successfully reset, but it did not begin running after the reset. **1** If the EI circuit pack is in the PN, temporarily remove the PN's Maintenance circuit pack. **2** Repeat the **reset board *PCSS*** command. **3** Re-insert the PN's Maintenance circuit pack if it was removed.
3	FAIL	The reset over the optical fiber failed. **1** Execute the **test board *PCSS*** command on the PN neighbor EI circuit pack located on the opposite end of the fiber from this EI circuit pack. If Test #238 does not pass, follow the maintenance procedure associated with this test result. Then perform the reset again. **2** If the EI circuit pack is in the PN, temporarily remove the PN's Maintenance circuit pack. **3** Repeat the **reset board *PCSS*** command. **4** Reinsert PN's Maintenance circuit pack if it was removed. **5** Follow the procedure described in the "Relationship Between Expansion Interface and Tone-Clock Circuit Packs" section if the symptoms match those described there. **6** Check the Error Log for the PN Tone-Clock errors that were resolved about the same time when the PN went down. These PN Tone-Clock errors may have been resolved *because* the PN went down. When there is no Tone-Clock generating the system clock on a PN, then an EI circuit pack can only be reset once. Every subsequent reset attempt fails. It is also possible that the system itself may have already tried to reset the EI circuit pack. See TONE-BD (Tone-Clock Circuit) on page 1902 for recommended maintenance strategy for Tone-Clock problems.
		7 If the reset still fails, execute the Manual Loop Back Procedure on the opposite PN EI circuit pack. This procedure is described in the section preceding the Hardware Error Log Entries and Test to Clear Values table for this MO. If the EI circuit pack and the lightwave transceiver are healthy, the problem must lie with the EI circuit pack and its lightwave transceiver on the PN end of the fiber or with the fiber itself. Test the PN EI circuit pack with the manual loop back procedure and investigate the test results.

Table 398: Test #224 Expansion Interface Test

Error Code	Test Result	Description / Recommendation
5001	FAIL	Initialization failure: the EI circuit pack reset successfully and restarted execution, but the EI circuit pack could not synchronize itself during hardware initialization. **1** Issue the **reset board *PCSS*** command. If the circuit pack is in the active link, this procedure can be very destructive. If a **test board *PCSS*** shows every test passing, and there is no standby link to which you can switch, perform this reset at a time when service is least disrupted by losing use of the PN. **2** If the reset fails with the same error code, execute the **test tone-clock *PC*** command where P is the network that contains this EI circuit pack and C is the carrier that contains the active Tone-Clock on network P. Also look for SYNC and TONE-BD errors. Resolve any SYNC and TONE-BD errors by following the Maintenance documentation for these MOs. Then reissue the **reset board *PCSS*** command. **3** If the EI circuit pack still fails to reset with the same error code, replace the EI circuit pack.
5002	FAIL	**Initialization failure:** EI circuit pack reset successfully and restarted execution. But the EI circuit pack has determined that a lightwave transceiver was not attached to the backplane connector when the EI circuit pack was last reset. If this system does not have duplicate EI links, every user in the PN will be without service until this problem is resolved. If this system does have duplicate links, the backup EI link is unavailable until this problem is resolved. **1** Attach lightwave transceiver to 25-pair backplane connector **in slot belonging to EI circuit pack**. **2** Reset the circuit pack again. **3** If the reset fails with an Error Code other than 5002, refer to the appropriate maintenance section. **4** If the reset fails again with Error Code 5002, replace the lightwave transceiver, reset the circuit pack, and execute the **reset board *PCSS*** command again. **5** If the reset fails again with Error Code 5002, the new lightwave transceiver may be defective, or the EI circuit pack may need to be replaced.

Table 398: Test #224 Expansion Interface Test

Error Code	Test Result	Description / Recommendation
5016, 5017, 5018, 5019, 5032, 5033, 5048, 5064, 5080, 5096, 5112	FAIL	Initialization failure: the EI circuit pack reset successfully and restarted execution, but the EI circuit pack detected communication errors during hardware initialization. The nature of the failure may prevent the EI circuit pack from communicating with its neighbor EI circuit pack on the opposite end of the fiber. The fault itself may be either on the EI circuit pack or on the lightwave transceiver. **1** If every other test on this EI circuit pack is passing and no other errors have been logged against this circuit pack, replacement of the lightwave transceiver or the circuit pack is recommended, but not critical. **2** If some tests on this EI circuit pack are failing or other errors have been logged against this circuit pack, replace the lightwave transceiver and/or the EI circuit pack.
	PASS	The EI was successfully reset, and it restarted execution. It also passed all of its initialization tests and detected a lightwave transceiver. Remove the EI circuit pack from the busyout state by using the **release board *PCSS*** command. **1** Execute **test board *PCSS* short** command. Refer to errors for each test.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use the **reset board *UUCSS*** command. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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EXP-PN (Expansion Port Network)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
EXP-PN	MAJOR	**display errors**[1]	Expansion Port Network

1 Investigate errors against EXP-PN and EXP-INTF.

The EXP-PN MO is responsible for overall maintenance of an Expansion Port Network (EPN). The focus of EPN maintenance is on the EI or on the ATM's EI circuit pack that is acting as the Expansion Archangel in an EPN. EXP-INTF or ATM-EI covers maintenance of the EI or ATM EI circuit pack, while EXP-PN covers a much broader area of activities and problems on an EPN. The alarming strategy for EXP-PN is fairly simple and does not make use of any failure analysis routine for spawning maintenance actions. EXP-PN alarming is based on the availability of an EPN for service and the EPN's response to various recovery actions.

When investigating alarms logged against an EPN, problems involving the EI, an ATM EI circuit pack acting as the Expansion Archangel, and problems that may involve loss of communication between the EPN and the media server should be investigated. This could ultimately include fiber links (FIBER-LK), DS1 converter circuit packs (DS1C-BD), SNI circuit packs (SNI-BD) and Switch Node Configurations (SN-CONF) for CSS. For ATM, this could include the PN ATM EI (ATM-EI) circuit pack, the ATM switch (ATM-NTWK), and EPN ATM EI (ATM-EI) circuit pack.

PN Restarts

While not an exhaustive discussion of PN recovery actions, this section describes at a high level the causes and effects of PN restarts so that these Error Log events can be understood.

PN Warm Restarts

PN Warm Restart (PN Reset Level 1) is generally performed on a PN when the recovery of that PN can be accomplished in less than 30 seconds. When possible, Warm Restart minimizes the work required to reinitialize a PN, and reduces the impact of a PN failure by avoiding the longer and highly destructive PN Cold Restart. The primary cause of PN restarts is failure of the link from the media server to the PN due to a hardware fault in the link's path. For most hardware failures, this link (and thus the PN) cannot be recovered until the failed hardware is replaced. However, several failures modes provide hardware redundancy allowing the link to be recovered quickly. For instance (in a duplex-, high-, or critical-reliability system), the failure of a Packet Interface circuit pack causes a media server interchange that allows the link to be recovered quickly over the newly active Packet Interface. Or on a Center Stage Switch (with multiple fibers interconnecting the switch nodes), a link carried on one fiber can be rerouted over another fiber.

If the EAL is recovered quickly, the PN Warm Restart returns the PN to service with minimal effects on user service. If the EAL cannot be recovered quickly, the PN is taken out of service and a PN Reset Level 2 (PN Cold Restart) is required to return it to service.

PN Cold Restarts

If the PN-to-PN link has failed and has not been recovered within 30 seconds, the PN is taken out of service and can be brought back into service only with a PN Reset Level 2 (PN Cold Restart). Effects of a PN Cold Restart include a reset of every circuit pack in the PN and the disconnection of every call to or from the PN. Calls with both endpoints within the PN are dropped upon recovery.

PN Restart Escalation

PN restarts follow an escalation strategy controlled by maintenance software. Whenever a request for a PN Reset Level 1 (PN Warm Restart) is made, software checks to see if the restart should be escalated to a PN Reset Level 2 (PN Cold Restart). If any of the following are true, the restart is escalated:

- At least two level 1 restarts have occurred and less than two hours has elapsed since the last occurrence.
- Current PN conditions do not allow a level 1 restart, such as when the PN is out of service.
- Less than 3 minutes has elapsed since the last PN Cold Restart, indicating that the PN is unstable.

If two PN Cold Restarts have been executed in less than an hour and the link is functional, but the PN has not recovered to an in-service state, a MAJOR alarm is raised against EXP-PN, and the PN is put into Emergency Transfer by system software. (Software can invoke PN Emergency Transfer only when the link to the PN is up. If the link is down, the hardware automatically invokes Emergency Transfer 1 minute after it detects a link failure).

Connectivity Alarming

When a PN is out of service, a MAJOR EXP-PN alarm is raised against that PN. A PN can only be alarmed if it is out of service *and* the fiber between the PN and PN is up. If the fiber from the PN to the Center Stage Switch is down (by removing it from administration, for example), every PN is lost but not alarmed, since they are not the cause of the problem. If, however, connectivity is restored and the PN fails to recover, the PN is alarmed.

For ATM, a PN can only be alarmed if it is out of service and the connections to the PN, ATM switch, and PN are up. If the connection from the PN to the ATM switch is down (by removing it from administration, for example), every PN is lost but not alarmed, since they are not the cause of the problem. As for CSS, if connectivity is restored and the PN fails to recover, the PN is alarmed.

Error Log Entries and Test to Clear Values

Table 399: Expansion Port Network (EXP-PN) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	0	None	None		
257 (b)	0	None	None		
513 (c)	0	None	MAJOR	OFF	
769 (d)	0	None	MAJOR	OFF	

Notes:

a Error Type 1: informational entry only, indicating that a PN Reset Level 1 (PN Warm Restart) has been executed on this PN.

b Error Type 257: informational entry only, indicating that a PN Reset Level 2 (PN Cold Restart) has been executed on this PN. This does not include restarts done at system initialization time.

c Error Type 513: indicates that a PN is not in service when it is expected to be. The value specified in the port field of the error log, is the PN number of the affected PN. When this condition occurs, examine every system link error and EXP-INTF or ATM-PNC error to aid in resolving the alarm (examples of system link errors are errors logged against PKT-INTF, EXP-INTF, SNI-BD, FIBER-LK, and PKT-BUS and for ATM, PKT-BUS, ATM-EI, ATM-NTWK). Also check that all fiber connectivity matches that have been administered for the system. This alarm and error is resolved and removed from the logs only when the PN comes back into service, or after fiber administration is changed to remove a fiber such that there is no connectivity from the PN to this PN.

d Error Type 769: This alarm is raised when PN maintenance has attempted to execute a Cold Restart recovery action two times, and both restarts failed. This will cause the PN to be placed in Emergency Transfer. Examine every EXP-INTF or ATM-EI error that, when cleared, may aid in resolving this alarm. Also check for any SNI-BD, SNI-PEER, FIBR-LK, SN-CONF, or DS1C-BD errors or for ATM, ATM-EI or ATM-NTWK errors that may indicate a communication problem between the processor and the PN. Make sure that the physical fiber connectivity matches that of system administration.

System Technician-Demanded Tests: Descriptions And Error Codes

EXP-PN does not support demand testing. A demand reset can be executed to perform a demand reset on a PN by using the **reset port-network *P* level 1** or **2** command (P is the port network's number, and 1 or 2 specifies the reset level).

PN Cold Restart (#955)

PN Cold Restart, or PN Reset Level 2, using the command **reset port-network *P* level 2** is used as a recovery mechanism for a PN that has been taken out of service. It is executed as a result of PN recovery escalation when a Warm Restart is not possible, or as a result of a system technician demanded PN restart. Once a PN has gone out of service, a PN Cold Restart is required to bring it back into service.

This is the most severe of the PN restarts, and users will experience a service outage. For the first 30 seconds after the occurrence of an event that requires a restart, every stable call is preserved (although new calls will be denied). All calls terminating in the PN are then dropped, and PN users are not able to place new phone calls during the restart. All PN hardware will also be re-initialized during this restart. The restart takes no longer than 2 minutes with service being restored much quicker in a typical restart situation.

Table 400: Test #955 PN Cold Restart

Error Code	Test Result	Description / Recommendation
1386	ABORT	The system link to this PN is unavailable and cannot be used. This reset cannot be executed without the link being operational. **1** Refer to SYS-LINK and resolve the link problem.
2100	ABORT	Could not allocate the necessary system resources to execute this reset.
2000	ABORT	Response to a request made in the internal portion of this reset procedure was not received within the allowable time period.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	The PN Cold Restart procedure completed successfully.

PN Warm Restart (#956)

The PN Warm Restart, or PN Reset Level 1, using the command **reset port-network *P* level 1** is used to restart a PN that has not been taken out of service. It is the least severe of the PN restart levels and is used in an attempt to preserve the state of the system as much as possible, thereby reducing user impact. This restart is attempted on a PN if it is still in service, or as a result of a system technician-demanded PN Warm Restart.

During a PN Warm Restart all calls are preserved including voice, data, and packet calls. Once an event has occurred that requires a warm restart, service is fully restored within 35 seconds.

Table 401: Test #956 PN Warm Restart

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to execute this reset. **1** Retry the command at 1-minute intervals up to 3 times.
1386	ABORT	The system link to this PN is unavailable and cannot be used. This reset cannot be executed without the link being operational. **1** See SYS-LINK and resolve the link problem.
1387	ABORT	This PN is not in a state where it is possible to perform a Warm Restart on the PN. It is necessary to perform a PN Cold Restart (PN Reset Level 2) because of one of the following reasons: • The PN is in an out-of-service state. • Insufficient time has elapsed since the last PN Cold Restart was performed on this PN.

Table 401: Test #956 PN Warm Restart

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to a request made in the internal portion of this reset procedure was not received within the allowable time period.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	Internal system error **1** Retry the reset command at 1-minute intervals up to 3 times.
	PASS	The PN Warm Restart procedure completed successfully.

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EXT-DEV (External device alarm)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
EXT-DEV	MINOR	**test environment *location***	External Device Alarm
EXT-DEV	MAJOR	**test environment *location***	External Device Alarm
EXT-DEV	MINOR	**test eda-external-device-alm *location* minor**	External Device Alarm
EXT-DEV	MAJOR	**test eda-external-device-alm *location* major**	External Device Alarm

1 For information on specifying a ***location***, see Command Syntax on page 179.

A TN2312BP IPSI, in a G650 with a carrier address set to A, has two alarm ports that connect to external devices. An example of an external device is an uninterruptible power supply (UPS). Refer to Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 for further information.

Conditions can occur on the external device that close the contacts on the alarm leads. This notifies the switch to originate an EXT-DEV alarm. One set of leads generates a major alarm, the other set generates a minor alarm.

In this case, the designation of major or minor refers to the port, not to the severity of the alarm associated with the connection. For example, the major port can be administered as a major, minor, or warning alarm, and the minor port can be administered as a major, minor, or warning alarm. Analog line ports can also be administered as external device alarms in the same manner.

Error log entries and test-to-clear values

Table 402: Test to clear with external device alarm administration enabled

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
1	—	Alarm query test (#120)	MAJOR/MINOR	OFF	**test eda-external-device-alm *location* major**

Table 403: Test-to-clear without external device alarm administration enabled

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
1	—	Alarm query test (#120)	MAJOR/MINOR	OFF	**test environment *location***

System technician-demanded test: Descriptions and error codes

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Alarm query test (#120)	X	X	ND

1 D = Destructive, ND = Nondestructive

Alarm query test (#120)

The external device alarm test requests the status of the external device alarm from a maintenance circuit pack and reports the results. The test has no affect on the external device itself. The **test environment** command will report an error against Test #120 if there is a short on one or both of the pairs of leads connecting the external device.

CAUTION:
Alarms can be generated on adjunct equipment, sent to the Avaya system, and recorded and reported as "external alarms". The adjunct equipment must provide an isolated contact closure across the alarm leads provided by the Avaya system. The contact must be rated at a minimum of 60 V DC, with a current carrying capacity of 5 mA minimum.

Table 404: Test #120 Alarm query

Error code	Test result	Description and Recommendation
1000	ABORT	This is an internal system error. **1** Repeat the command at one-minute intervals 1 to 3 times.
1035	ABORT	The port network is not available. **1** Use the **status port-network** command to verify that the network is not up. **2** Look for alarms against EXP-PN, EXP-INT, PK-INT, etc. **3** Use diagnostic procedures for those MOs to clear the problem.
2000	ABORT	A response to the test request was not received within the time allowed. **1** Repeat the command at one-minute intervals 1 to 3 times.

1 of 2

Table 404: Test #120 Alarm query

Error code	Test result	Description and Recommendation
ANY	FAIL	The external device alarm has been activated by the external device. **1** Clear the major alarm on the external device and repeat the test. **2** If the test fails, disconnect the external device alarm leads from the TN2312BP IPSI circuit pack and repeat the test. **3** If the test fails, there is a problem with the analog external device alarm port, the TN775 Maintenance circuit pack, or TN2312BP IPSI circuit pack that reports the alarm. There are failures that can occur on the TN775 and TN2312BP IPSI circuit pack that *are not* detected by their respective maintenance, but cause many environment tests to fail. If many environment tests fail, replace the circuit pack and repeat the test.
	PASS	If there is a problem with the external device, but none of the following report an alarm, the external device might not be reporting the problem correctly or the external device might not be properly connected to the external device alarm leads: • The administered analog line external device alarm • TN775D or later circuit pack • TN2312BP IPSI circuit pack

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EXT-DEV ADMIN? N (External Device Alarm)

S8700 / S8500 / S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
EXT-DEV	MAJOR	**test environment *UU***	External Device Alarm
EXT-DEV	MINOR	**test environment *UU***	External Device Alarm

1 Where ***UU*** is an appropriate cabinet number determined via the PORT field from the Alarm or Error Log.

NOTE:
Use this Maintenance Object when the `External Device Alarm Admin?` field on the *change system-parameters customer-options* form is set to **n**.

S8700 / **S8500**: The IPSI monitors the EXT-DEV alarm leads. **S8100**: The Processor in carrier A monitors the EXT-DEV alarm leads.

The system only recognizes pairs connected to the 1M and 1m (ALARM MONITOR) leads. Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring (*555-204-111) for more details.

Hardware Error Log Entries and Test to Clear Values

Table 405: EXT-DEV ADMIN?N Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment UU r 2 or 6
1 or 5	Any	External Device Alarm Test (#120)	MAJOR MINOR[2]	OFF	test environment UU r 2 or 6

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 One port generates a MAJOR alarm; the other port generates a MINOR alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Cabinet Query Test*, you may also clear errors generated from other tests in the testing sequence.

Table 406: EXT-DEV ADMIN?N System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Cabinet Query Test (#79)	X	X	ND
Emergency Transfer Query Test (#124) (a)	X	X	ND
External Device Alarm Test (MAJOR port) (#120)	X	X	ND
External Device Alarm Test (MINOR port) (#120)	X	X	ND
Analog Ring Generator Initialization Test (#117) (b)	X	X	ND
Analog Ring Generator Query Test (#118) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a Refer to EMG-XFER (Emergency Transfer) on page 885 for a description of this test.

b Refer to RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

External Device Alarm Test (#120)

The External Device Alarm Test requests the state of the External Device Alarm from the Maintenance circuit pack and reports the results. The test has no effect on the external device itself.

Table 407: TEST #120 External Device Alarm Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier. Look for and resolve all AC-POWER alarms. Then, repeat the test. **3** If the test continues to ABORT with a 2000 error code, check for and resolve all SYSAM errors. Then, repeat the test.
2029 2319 2320 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals a maximum of 5 times.

Table 407: TEST #120 External Device Alarm Test *Continued*

Error Code	Test Result	Description/ Recommendation
ANY	FAIL	The External Device Alarm has been activated by the external device. **1** Clear the major alarm on the external device, and rerun the test. **2** If the test still fails, then disconnect the External Device Alarms from the Maintenance circuit pack and rerun the test. **3** If the test still fails, then there is a problem with the Maintenance circuit pack that is reporting the alarm. This circuit pack should be replaced. There are failures that can occur on Maintenance circuit pack's that *will not* be detected by their respective maintenance, but which will cause many environment tests to fail. If many environment tests are failing, the suspect circuit pack should be replaced and the test rerun.
	PASS	If there is a problem with the external device, but the Maintenance circuit pack connected to the device reports no alarm, then the External Device may not be properly reporting the problems or the External Device may not be properly connected to the External Device.

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EXT-DEV ADMIN? Y (External Device Alarm)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run [1]	Full Name of MO
EXT-DEV	MAJOR	**test eda-external-device-alrm *UU***	External Device Alarm
EXT-DEV	MINOR	**test eda-external-device-alrm *UU***	External Device Alarm
EXT-DEV	WARNING	**test eda-external-device-alrm *UU***	External Device Alarm

1 ***UU*** is a cabinet number determined in the `Port` field of the Alarm or Error Log.

NOTE:
Use this MO when the `External Device Alarm Admin?` field on the ***change system-parameters customer-options*** screen is set to **y**. You must have INADS or INIT login permissions to administer EXT-DEV Alarm.

S8700 / S8500

Each PN's Maintenance circuit pack has two alarm ports that connect to such external devices as uninterruptible power supplies (UPSs) or adjuncts (e.g., AUDIX).

Certain conditions on the external device close the contacts on the alarm leads to notify the switch that in turn originates an EXT-DEV alarm. One set of leads generates a major alarm; the other set generates a minor alarm.

The special locations UUmajor and UUminor are used to designate the major or minor Maintenance board's alarm connection for cabinet UU. The major/minor designation specifies the port, not the alarm level associated with the connection; *for example*, the "major" port can be administered as a major, minor, or warning alarm, and the "minor" port can be administered as a major, minor, or warning alarm. In addition Analog line ports can also be administered as external device alarms.

NOTE:
An unadministered Maintenance board's external device alarm port, that is sensing a contact closure will have an entry in the Error Log and in the Alarm Log. The alarm receiver will not receive warning alarms.

S8100

For S8100, an EXT-DEV alarm can be generated from a contact closure on an analog station port on a Virtual Alarm board plugged into the virtual port location 1A11, from an analog station port administered for External Device Alarms (EDA), or from a contact closure on the Major or Minor alarm leads on the TN2314.

The Virtual Alarm board is used to pass PC and AUDIX alarm information between the Global Alarm Manager (GAM) process and the other processes within Communication Manager. These virtual alarm leads are administered on the *add eda* screen, when the ALT Name field is set to ECSPLAT. An OFF HOOK generates an alarm condition (Alarm LED on the Attendant console and the CMC1 cabinet are on), an ON HOOK is a non-alarm condition (Alarm LED on the Attendant console and the CMC1 cabinet are off). The alarm is not forwarded to INADS.

NOTE:
For S8100, the PR-AL-BD MO is used for board insertion of the virtual alarm board. There is no hardware associated with this MO. The virtual board is required in order to assign external device alarm ports for non-Communication Manager alarms (for example, PC level alarms or AUDIX alarms) in order to enter non-Communication Manager alarms in the Communication Manager alarm log.

The external name used by maintenance for the virtual alarm board is PR-AL-BD. This appears on the screen displayed for the results of the ***test board*** command. The external name used by administration for the board is VIRTUAL ALARM BD. This appears on the screen for the *list configuration* and *change circuit pack* commands. The TN number assigned to this board is VIRALM.

Alarm leads can be connected to external devices such as Uninterruptible Power Supplies (UPS) or adjuncts. Certain conditions on the external device close the contacts on the alarm leads to notify the switch which in turn originates an EXT-DEV alarm.

The special locations *major* and *minor* are used to designate the major or minor processor board alarm connection. The major/minor designation specifies the port, not the alarm level associated with the connection; for example, the “major” port can be administered as a major, minor, or warning alarm, and the “minor” port can be administered as a major, minor or warning alarm. In addition Analog line ports can also be administered as external device alarms.

NOTE:
For S8100, the major lead is always assigned to an external Uninterruptible Power Supply even if a UPS is not provided since that lead also causes a system shutdown after one minute.

Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	**test eda-external-device-alrm *physical-location* r 2 | 6**
1 or 5	Any	External Device Alarm test (#120)	Any	OFF	**test eda-external-device-alrm *physical-location* r 2 | 6**

NOTE:
The loss of -48 volt power prevents detection of an external device alarm. AC-POWER, CARR-POW, and DC-POWER alarms could indicate the loss of the external device alarm -48 volt power source. ALARM-PT alarms may also indicate a loss of power. When analog line ports are administered as analog line external device alarms loss of -48 volts prevents detection of an external device alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Battery & External Device Alarm* test (#120), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
External Device Alarm test (MAJOR port) (#120)	X	X	ND
External Device Alarm test (MINOR port) (#120)	X	X	ND
External Device Alarm test (WARNING port) (#120)	X	X	ND

1 D = Destructive; ND = Nondestructive

External Device Alarm Test (#120)

The External Device Alarm Test requests the state of the External Device Alarm from a Maintenance circuit pack and reports the results. The test has no effect on the external device itself.

Table 408: Test #120 External Device Alarm Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1035	ABORT	The PN containing this equipment is not available. Resolve every PN problem with this cabinet.

Table 408: Test #120 External Device Alarm Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** (Maintenance Board) If the test continues to ABORT with Error Code 2000, check for system powering problems with the A carrier. Resolve every AC-POWER and CARR-POW alarm in a multicarrier cabinet or DC-POWER alarms in a single-carrier cabinet. Then, repeat the test. **3** (Maintenance Board) If the test continues to ABORT with a 2000 Error Code, resolve every maintenance circuit pack error. Then, repeat the test.
2029, 2100, 2319, 2320, 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	**S8100** If this is an S8100 system and the port location is 1A1101 or 1A1102, the failure is associated with a non-Communication Manager alarm generated by AUDIX or the Global Alarm Manager (GAM). Follow the steps below: Start up a bash session and enter the **alarmstat** command to determine which subsystem generated the alarm. See Alarms in the S8100 Media Server and Windows 2000 Log Events on page 140for more information. If the alarm is from the GAM, use the **gamalarmstat** command to identify the source of the problem. Follow the procedures presented in Alarms in the S8100 Media Server and Windows 2000 Log Events on page 140 to identify and clear the problem. If the alarm is from AUDIX, start up an AUDIX terminal session using DSA, enter the **display alarm** command, and follow the AUDIX maintenance procedures to identify and clear the problem. The External Device Alarm has been activated by the external device. **1** Clear the major alarm on the external device, and rerun the test. **2** If the test still fails, then disconnect the External Device Alarm Leads from the Maintenance circuit pack and rerun the test. **3** If the test still fails, then there is a problem with the analog external device alarm port or the Maintenance circuit pack that is reporting the alarm. This circuit pack should be replaced. There are failures that can occur on the Maintenance circuit pack that *will not* be detected by their respective maintenance, but that will cause many environment tests to fail. If many environment tests are failing, the suspect circuit pack should be replaced and the test rerun.

Table 408: Test #120 External Device Alarm Test

Error Code	Test Result	Description / Recommendation
	PASS	If there is a problem with the external device, but the administered analog line external device alarm, or the administered Maintenance circuit pack connected to the device reports no alarm, then the External Device may not be properly reporting the problems or the External Device may not be properly connected to the External Device Alarm Leads.

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FIBER-LK (Fiber Link)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
FIBER-LK	MAJOR	**test fiber-link *F pnc* s**	Fiber Link
FIBER-LK	MINOR	**test fiber-link *F pnc* s**	Fiber Link
FIBER-LK	WARNING	**test fiber-link *F pnc* s**	Fiber Link

1 ***F*** is the fiber link number; ***pnc*** is either "a-pnc" or "b-pnc" (always "a-pnc" for a standard-, high-, or critical-reliability system).

A fiber link consists of the endpoint boards that are connected via the optical fiber, the lightwave transceivers or metallic connections on the endpoint boards, and, if administered, the DS1 Converter (DS1 converter) complex that exists between the two fiber endpoints. The fiber endpoints are EI circuit packs and/or SNI (SNI) circuit packs.

Three types of fiber links exist in G3r systems:

EI-to-EI fiber	This type of fiber is an EI-to-EI connection and is only used in direct connect PNC.
EI-SNI fiber	This type of fiber is an EI-to-SNI connection and is only used in Center Stage Switch (CSS) PNC.
SNI-SNI fiber	This type of fiber is an SNI-to-SNI connection and is only used in CSS PNC when two switch node carriers are connected in a 2- or 3-switch node configuration.

Fiber link errors and alarms are generated only on fibers that have at least one SNI endpoint. Fiber errors for fibers that have EIs as both endpoints are detected by the EI circuit pack, thus generating off-board EXP-INTF errors and alarms. Fiber errors and alarms on EI-SNI fiber links generate FIBER-LK and/or off-board EXP-INTF errors and alarms.

Fiber links are administered via **add fiber-link *F*** or **add fiber-link next**, where F is the fiber link's number. The 2 endpoints of the fiber are administered (EI and EI, EI and SNI, or SNI and SNI). In a duplicated PNC configuration, both the A- and B-PNC's fiber links are assigned with the same fiber link's number. The fiber links are designated by ***F P***, where F is the fiber link's number and P is the PNC, A-PNC or B-PNC. In addition, a DS1 converter complex may be assigned to the fiber link. In a duplicated PNC configuration, both the A- and B-PNC's DS1 converter complexes are administered with the same fiber link's number. DS1 facilities and parameters can be modified via **change fiber-link *F P***.

An individual fiber link can be displayed with the **display fiber-link *F*** command. Every fiber link can be listed using the **list fiber-link** command.

The following terms are used in the error descriptions:

Control Path	The path between the two fiber endpoints that is necessary for the two endpoint circuit packs to communicate.
Circuit Path	The path between the two fiber endpoints that is necessary for circuit switched phone calls to work.
Neighbor	The circuit pack on the other end of the fiber.
Out of Frame	A circuit pack reports fiber out of frame if it cannot detect valid data coming from the fiber.
Packet Path	The path between the two fiber endpoints that is necessary for packet-switched messages to be sent between the two fiber endpoints.

LEDs for Circuit Packs on a Fiber Link

The amber LEDs on the three types of boards, SNI (TN573), EI (TN570), and DS1 Converter (TN574 or TN1654), that may be a part of the fiber link can help in diagnosing problems with the fiber link. The amber LED states are as follows. The flashing LED patterns take precedence over the active or standby LED patterns.

If both endpoints of a fiber link (EI and/or SNI) are flashing with a fiber out of frame pattern, a fast amber LED pattern (0.1 second on and 0.1 second off), check the lightwave transceivers (if present). Both lightwave transceivers on the fiber link must be of the same type. The 9823a shortwave transceiver and the 9823b longwave transceiver must never be combined on the same fiber link because a fiber out-of-frame condition will exist. The 9823a lightwave transceiver should be used for distances up to 4900 feet and the 9823b lightwave transceiver should be used for distances up to 25,000 feet.

Table 409: SNI Amber LED Flashing Codes

Condition	LED on	LED off
Fiber out of Frame	0.1 second	0.1 second
In Frame, No Neighbor[1]	0.5 second	0.5 second
SNI active	Solid on	Never off
SNI standby	Never on	Solid off

1 The fiber is in frame, but no communication exists to the neighbor

Table 410: Expansion Interface Circuit Pack Amber LED Flashing Codes

Condition	LED on	LED off
Fiber Out-of-Frame	0.1 second	0.1 second
(a) In frame-No Neighbor	0.5 second	0.5 second
(b) Expansion Interface Active	2 second	0.2 second
(c) Expansion Interface Active	Solid on	Never off
(d) Expansion Interface Standby	Never on	Solid off

Notes:

a The fiber is in frame, but no communication exists to the neighbor.

b This is the normal state for an active PN EI circuit pack that is also the bus master (expansion Archangel) in the PN.

c This is the normal state for an active EI circuit pack that is not the bus master (expansion Archangel) for a PN. This applies only in the direct connect configuration where the EI circuit pack in a PN connects via a fiber link to an EI circuit pack in the other PN. This state also applies for an active EI circuit pack located in the PN.

d This is the normal state for a standby expansion Interface circuit pack in the PN.

For more details about how the EI circuit pack error codes relate to the LED states, see EXP-INTF (Expansion Interface Circuit Pack) on page 911.

Table 411: DS1 Converter Amber LED Flashing Codes

Condition	LED on	LED off
(a) Fiber out of Frame	0.1 second	0.1 second
(b) In frame, fiber channel is down	0.5 second	0.5 second
(c) In frame, DS1 channel down	1 second	1 second
(d) DS1 converter, no response from media server	2 second	0.2 second
DS1 converter active	Solid on	Never off
DS1 converter standby	Never on	Solid off

Notes:

a A Fiber is out of frame or a fiber loss-of-signal condition exists.

b DS1 converter/fiber endpoint communication is down.

c The DS1 channel is down between the two DS1 converters in the DS1 converter complex.

d The media server is not acknowledging messages from the DS1 converter circuit pack or the DS1 converter circuit pack does not have a processor route. This pattern indicates a probable software problem.

In addition to the traditional red, green, and amber LEDs, the DS1 converter circuit pack has four green LEDs that indicate whether a receive signal is present for each DS1 facility.

Error Log Entries and Test to Clear Values

Table 412: Fiber Link Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test fiber-link** *F P* **r 1**
1 (b)	any	failure audit (#777) (a)	MAJOR, MINOR, WARNING	OFF	**test fiber-link** *F P* **r 1**
18 (c)	0	**busyout fiber** *F P*	WARNING	OFF	**release fiber** *F P*
257 (d)	any	failure audit (#777) (a)	MAJOR, MINOR, WARNING	OFF	**test fiber-link** *F P* **r 1**
513 (e)	any	failure audit (#777) (a)	MAJOR, MINOR, WARNING	OFF	**test fiber-link** *F P* **r 1**
76 9(f)	any	failure audit (#777) (a)	MAJOR, MINOR, WARNING	OFF	**test fiber-link** *F P* **r 1**
1025 (g)	any	failure audit (#777) (a)	MAJOR, MINOR, WARNING	OFF	**test fiber-link** *F P* **r 1**
1281 (h)	any	failure audit (#777) (a)	MAJOR, MINOR, WARNING	OFF	**test fiber-link** *F P* **r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a The failure audit test (#777) should be run to confirm whether the error still exists.

b This error indicates problem with the control path to the neighbor.

c This error indicates that the fiber link has been busied out via the **busyout fiber-link *F P*** command. To resolve this error, release the fiber link with the **release fiber-link *F P*** command.

d This error indicates problem with the circuit path to the neighbor.

e This error indicates problem with the packet path to the neighbor.

f This error indicates problem with the control path from the neighbor.

g This error indicates problem with the circuit path from the neighbor.

h This error indicates problem with the packet path from the neighbor.

For note b and notes d through h, perform the following steps:

1 Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.

2 Enter **display errors** and if any of the listed slip errors exist, follow the associated repair procedures in the SYNC section for slip errors.

Table 413: Error Log Entries for Slip Errors

Circuit Pack's Name	Error Log Name	Error Log Entry (for Slips)
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
SNI	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the following order when inspecting errors in the system. For example, by clearing error codes associated with the EI Out-of-Frame Query test (#238), you may also clear errors generated by other tests later in the sequence.

Table 414: Tests Run for an EI-to-EI Fiber Link

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Fiber Sequence	D/ND[1]
EI Out-of-Frame Query test (#238)	X	X		ND
EI Neighbor Query test (#237)	X	X		ND
Fiber Link Reset test (#768)			X	D

1 D = Destructive; ND = Nondestructive

Table 415: Tests Run for an EI-to-SNI Fiber Link

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Fiber Sequence	D/ND[1]
EI Out-of-Frame Query test (#238)	X	X		ND
EI Neighbor Query test (#237)	X	X		ND
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Fiber Out of Frame query (#989)	X	X		ND
Destructive Facility test (#757)		X		D
Off-Board Destructive Facility test (#756)		X		D
Fiber Link Reset test (#768)			X	D

1 D = Destructive, ND = Nondestructive

Table 416: Tests Run for an SNI-to-SNI Fiber Link

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Fiber Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Fiber Out of Frame query (#989)	X	X		ND
Destructive Facility test (#757)		X		D
Off-Board Destructive Facility test (#756)		X		D
Fiber Link Reset test (#768)			X	D

1 D = Destructive; ND = Nondestructive

Expansion Interface Neighbor Query Test (#237)

This test is nondestructive. The Expansion Interface Neighbor Query test is a request to an EI circuit pack to determine whether it has established communication with the EI or SNI circuit pack at the opposite end of the fiber.

For EI-to-EI fiber links, this test is run on both EI circuit pack endpoints of the fiber link.

Table 417: Test #237 Expansion Interface Neighbor Query Test

Error Code	Test Result	Description / Recommendation
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. Because **test fiber-link** was run, the expansion interface should be administered on a fiber link, and this must be a software problem.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link, and follow the procedures for this test in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
2031	ABORT	The attempt to send the message to the EI circuit pack, asking it who it's neighbor is, was not successful. **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link, and follow the procedures for this test in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
2100	ABORT	System resources required to run this test are not available. **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link, and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.

Table 417: Test #237 Expansion Interface Neighbor Query Test

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link, and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
1033	FAIL	The EI circuit pack under test cannot make contact with opposite end EI or SNI circuit pack. **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link, and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
2027	FAIL	The EI circuit pack has contact with the opposite EI or SNI circuit pack, but it is the incorrect EI or SNI circuit pack. **1** Run **test board UUCSS** separately for each EI endpoint on this fiber link, and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
	PASS	The EI circuit pack(s) have successfully established a link with the opposite EI or SNI circuit pack. **1** If **status port-network** still indicates that this link is down, it is possible that one or both of the EI and/or SNI circuit packs have been busied out. **2** If the link still does not come up, reset one or both EI and/or SNI circuit packs on the link.

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Expansion Interface Fiber Out-of-Frame (FOOF) Query Test (#238)

This test is nondestructive.

This test is a request to an EI circuit pack to determine whether it is currently detecting the framing sequence on the incoming fiber's data stream. If it cannot detect this framing signal, the EI circuit pack will not be able to establish a link with the opposite EI or SNI circuit pack.

For EI-to-EI fiber links, this test is run on both EI circuit pack endpoints of the fiber link.

Table 418: Test #238 Expansion Interface Fiber Out-of-Frame Query Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error (software). **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link and follow the procedures for this test in the EXP-INTF (Expansion Interface Circuit Pack) on page 911 section of the maintenance manual. **2** If the test continues to abort or fail, escalate the problem.

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Table 418: Test #238 Expansion Interface Fiber Out-of-Frame Query Test

Error Code	Test Result	Description / Recommendation
1033	ABORT	The EI circuit pack does not have a fiber link administered to it. There is not sufficient data to run test. Because **test fiber-link** was run, the expansion interface should be administered on a fiber link, therefore this must be a software problem.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
2100	ABORT	System resources required to run this test are not available. **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
2500	ABORT	Internal system error **1** Run **test board *UUCSS*** separately for each EI endpoint on this fiber link and follow the procedures in EXP-INTF (Expansion Interface Circuit Pack) on page 911.
	FAIL	EI circuit pack can't frame up to incoming signal. Several fail codes may be returned depending on which endpoint can't frame up. Error codes 2326, 2327, and 2328 denote Endpoint 1, Endpoint 2, and both endpoints, respectively. **1** Clear any SYNC and TDM-CLK errors listed in the error log. **2** Run **test board *UUCSS*** for each EI board on this fiber link and follow the appropriate repair sequence for any failing tests. **3** If the EI circuit pack fails Test #238 and is in the PN, and the red LEDs are ON for a large number of circuit packs, then reseat any Tone-Clock circuit packs in the PN. See the "How to replace Tone-Clock circuit packs" section of TDM-CLK (TDM Bus Clock) on page 1847 Maintenance documentation. **4** Enter display errors and follow the associated repair procedures for any SNC-BD (if applicable to this fiber link configuration) or TDM-BUS errors. **5** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*", described in Chapter 5. **6** If the test continues to abort, follow normal escalation procedures.
	PASS	The EI circuit pack(s) have detected the valid framing signal on the fiber. **1** Refer to errors from other EI circuit packs, SNI (SNI) tests, or DS1 Converter tests (if present) if the link is still not functioning.

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SNI Off-Board Destructive Facility Test (#756)

This test is **destructive**.

The SNI runs a destructive loop around of the on- and off-board looparounds. This test returns the result of the off-board loop around, while Test 757 returns the result of the on-board loop around. For SNI-to-SNI fiber links, this test is run on both SNI circuit pack endpoints of the fiber link.

Table 419: Test #756 SNI Off-Board Destructive Facility Test

Error Code	Test Result	Description / Recommendation
1015	ABORT	The system will not allow this test to be run because the fiber link has not been busied out. Busyout the fiber link with **busyout fiber-link *F P***. Run **test fiber-link *F P* long**.
1415	ABORT	The lightwave transceiver is absent from Endpoint 1 of the fiber link. Use**list fiber-link** to display fiber link endpoints. **1** If a lightwave transceiver should not be present, do nothing. For example, an SNI connected to a DS1 converter circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. This test can only be run when a lightwave transceiver exists. **2** Otherwise, continue with the following steps. **3** Check the lightwave transceiver connections. **4** Replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type (both are 9823a or both are 9823b). If they are not the same type, replace one of the lightwave transceivers. **5** Replace the SNI circuit pack.
1416	ABORT	The lightwave transceiver is absent from Endpoint 2 of the fiber link. Use **list fiber-link** can be used to display fiber link endpoints. **1** If a lightwave transceiver should not be present, do nothing. For example, an SNI connected to a DS1 converter circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. This test can only be run when a lightwave transceiver exists. **2** Check the lightwave transceiver connections. **3** Replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type (both are 9823a or both are 9823b). If they are not the same type, replace one of the lightwave transceivers. **4** Replace the SNI circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test.

Table 419: Test #756 SNI Off-Board Destructive Facility Test

Error Code	Test Result	Description / Recommendation
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	A fiber link's SNI circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where the SNI board(s) reside to verify whether their LEDs light. If not, continue with the following steps. **2** If LEDs light on other boards in the same carrier (but not on this board), issue **test board *UUCSS* l** (#760) for the active SNC in this carrier. Wait 5 minutes, and try step 1 again. If the board's LEDs still do not light, replace the board. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) **3** If no LEDs light on any board in the same carrier, fix any connectivity problems between this carrier and the media server. Use **list fiber-link** to determine the fiber connections to this carrier. Check the LEDs on every SNI and EI, and fix any fiber problems. Enter **display errors**, and resolve any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
127	FAIL	The data is not correctly looped around on Endpoint 1 of the fiber link. Use **list fiber-link** to display fiber link endpoints. **1** Check the lightwave transceiver. **2** Replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type (both are 9823a or both are 9823b). If they are not the same type, replace one of the lightwave transceivers. **3** Replace the SNI circuit pack.
227	FAIL	The data is not correctly looped around on Endpoint 2 of the fiber link Use **list fiber-link** can be used to display fiber link endpoints. **1** Check the lightwave transceiver. **2** Replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type (both are 9823a or both are 9823b). If they are not the same type, replace one of the lightwave transceivers. **3** Replace the SNI circuit pack.
	PASS	No problems associated with this test are detected on the SNI(s).

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SNI Destructive Facility Test (#757)

This test is **destructive**.

The SNI runs a destructive loop around of the on- and off-board looparounds. This test returns the result of the on-board loop around, while Test 756 returns the result of the off-board loop around.

For SNI-to-SNI fiber links, this test is run on both SNI circuit pack endpoints of the fiber link.

Table 420: Test #757 SNI Destructive Facility Test

Error Code	Test Result	Description / Recommendation
1015	ABORT	The system will not allow this test to be run because the fiber link has not been busied out. Busyout the fiber link with **busyout fiber-link *F P***. Enter **test fiber-link *F P* long**.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test.
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	A fiber link's SNI circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where the SNI board(s) reside to verify whether their LEDs light. If not, continue with the following steps. **2** If LEDs light on other boards in the same carrier (but not on this board), issue **test board *UUCSS* l** (#760) for the active SNC in this carrier. Wait 5 minutes, and try step 1 again. If the board's LEDs still do not light, replace the board. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) **3** If no LEDs light on any board in the same carrier, fix any connectivity problems between this carrier and the media server. Use **list fiber-link** to determine the fiber connections to this carrier. Check the LEDs on every SNI and EI, and fix any fiber problems. Enter **display errors**, and resolve any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
127	FAIL	The data is not correctly looped around on Endpoint 1 of the fiber link. Use **list fiber-link** to display fiber link endpoints. **1** Replace the SNI circuit pack.
227	FAIL	The data is not correctly looped around on Endpoint 2 of the fiber link. Use **list fiber-link** to display fiber link endpoints. **1** Replace the SNI circuit pack.
	PASS	No problems associated with this test are detected on the SNI(s).

Configuration Audit (#759)

This test is **non**destructive.

This test is run via the **test board short** or **test board long** command for SNI circuit packs or via **test fiber-link** for fiber links with SNI endpoint(s).

This test queries the SNI for SNCs in the same switch node carrier, SNI peers, DS1 converter s, and EI or SNI neighbors that the SNI can communicate with and compares this data to the administered data.

Failures of this test cause entries in the error and alarm logs against Switch Node Configuration (SN-CONF) with the board location of the SNI.

This test is unable to detect the case where an SNI is connected to the same type of board (EI or SNI) as administered but located in a different cabinet but the same carrier and same slot as the administered fiber endpoint. The administered fiber endpoint can be viewed with the **list fiber-link** command. This test can only detect if the fiber endpoint connected to the SNI is in a different carrier, slot location than the administered fiber endpoint.

If the SNI is connected to the same type of fiber endpoint as the administered fiber endpoint, but the location is the same as administered except for the cabinet, no phone calls will work correctly; some phone calls will not go through and some phone calls will ring the wrong phone.

The **test led** command can be used in this case to check connectivity.

1. Run the **test led port-network** command for each administered PN, and verify that the LEDs on the correct PN are lit.

   If not, check that the fiber connections to the PN are consistent with the administered fibers (**list fiber-link**) that do not light the LEDs as expected.

2. Run the **test led switch-node** command for each administered switch node carrier (SNC), and verify that the LEDs on the correct SNC are lit.

   If not, check the connectivity to the SNC that does not light the LEDs as expected.

Table 421: Test #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test for endpoint 1 of the fiber link. Use **list fiber-link** to display a fiber link's endpoints. If this fiber link has two SNI endpoints, run **test board *UUCSS*** separately for each SNI and follow the repair procedures in section SNI-BD.
2300	ABORT	The downlink message necessary to run this test could not be sent. If this fiber link has two SNI endpoints, run **test board *UUCSS*** separately for each SNI and follow the repair procedures in section SNI-BD. Use **list fiber-link** to display fiber link endpoints.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. If this fiber link has two SNI endpoints, run **test board *UUCSS*** separately for each SNI and follow the repair procedures in section SNI-BD. Use **list fiber-link** to display fiber link endpoints. **1** Retry the command at 1-minute intervals up to 3 times.

Table 421: Test #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
2306	ABORT	An SNI circuit pack on the fiber link is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node(s) where the SNI(s) reside to verify whether the LEDs on the board(s) light. Follow the steps below for the SNI(s) that had no LEDs light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run Test #760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace the board. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the media server. Use **list fiber-link** to determine the fiber connections to this carrier. Check the LEDs on every SNI and EI, and fix any fiber problems. Enter **display errors** and resolve any EXP-INTF error entries associated with the PN. Also, resolve any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
2500	ABORT	Internal system error If this fiber link has two SNI endpoints, run **test board *UUCSS*** separately for each SNI and follow the repair procedures in section SNI-BD. (The **list fiber-link** command displays a fiber link's endpoints.) Otherwise: **1** Retry the command at 1-minute intervals up to 3 times.
102	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 2. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1, replace the SNI in slot 2.

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Error Code	Test Result	Description / Recommendation
103	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 3. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 257, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 257, replace the SNI in slot 3.
104	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 4. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 513, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER Error Type 513, replace the SNI in slot 4.
105	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 5. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 769, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER Error Type 769, replace the SNI in slot 5.

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Error Code	Test Result	Description / Recommendation
106	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 6. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1025, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1025, replace the SNI in slot 6.
107	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 7. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1281, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1281, replace the SNI in slot 7.
108	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 8. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1537, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1537, replace the SNI in slot 8.

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Error Code	Test Result	Description / Recommendation
109	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 9. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1793, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1793, replace the SNI in slot 9.
112	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the active SNC. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Check the error log for other SNI circuit packs in the same carrier with a 257 SNI-BD error. Use **display errors** with category PNC to view SNI-BD errors. If other SNI circuit packs in the same switch node carrier have Error 257, then replace the active SNC in this switch node carrier. Replacing an SNC may be service interrupting. Refer to the SNC-BD section for the procedure for replacing an SNC. **2** Replace this SNI. **3** Replace the active SNC in the same switch node carrier.
113	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 13. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2049, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2049, replace the SNI in slot 13.

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Error Code	Test Result	Description / Recommendation
114	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 14. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2305, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2305, replace the SNI in slot 14.
115	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 15. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2561, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2561, replace the SNI in slot 15.
116	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 16. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2817, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2817, replace the SNI in slot 16.

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Error Code	Test Result	Description / Recommendation
117	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 17. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3073, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3073, replace the SNI in slot 17.
118	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 18. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3329, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3329, replace the SNI in slot 18.
119	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 19. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3585, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3585, replace the SNI in slot 19.

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Error Code	Test Result	Description / Recommendation
120	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with the equipped SNI in slot 20. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3841, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3841, replace the SNI in slot 20.
133	FAIL	No neighbor link is assigned, but the SNI (Endpoint 1) has an EI neighbor. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Administer the SNI on a fiber link to the EI neighbor it is connected to via the **add fiber-link next** command. Or remove both fiber endpoints (i.e., this SNI and its EI neighbor) and remove the fiber endpoints from circuit pack administration via **change circuit-pack**.
134	FAIL	No neighbor link is assigned, but the SNI (Endpoint 1) has an SNI neighbor. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Administer the SNI on a fiber link to the SNI neighbor it is connected to via the **add fiber-link next** command. Or remove both fiber endpoints (i.e., this SNI and its SNI neighbor) and remove the fiber endpoints from circuit pack administration via **change circuit-pack**.
135	FAIL	The SNI circuit pack (Endpoint 1) cannot communicate with its assigned neighbor. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Check if the administered neighbor is inserted. If not, insert the neighbor circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
136	FAIL	The Endpoint 1 SNI's administered neighbor does not match the physical neighbor connected. (The **list fiber-link** command displays a fiber link's endpoints.) The SNI's assigned neighbor is another SNI, but the SNI is physically connected to an EI. Enter **list fiber-link**, and verify that the fiber-optic and metallic cables are installed as administered.
137	FAIL	The Endpoint 1 SNI's administered neighbor does not match the physical neighbor connected. (The **list fiber-link** command displays a fiber link's endpoints.) The SNI's assigned neighbor is an EI, but the SNI is physically connected to another SNI. Enter **list fiber-link,** and verify that the fiber-optic and metallic cables are installed as administered.

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Error Code	Test Result	Description / Recommendation
138	FAIL	The physical location of SNI Endpoint 1's neighbor does not match its administered location. (Enter **list fiber-link** to display a fiber link's endpoints.) One location (carrier and slot) is assigned for the endpoint's neighbor, but it physically resides in another location. **1** Enter **list fiber-link**, and verify that the fiber-optic and metallic cables are installed as administered. **2** If the problem does not seem to be caused by either a physical-connection or an administration problem, replace the neighbor circuit pack. The neighbor circuit pack may have a hardware problem causing it to report a wrong angel address (physical carrier/slot address) to software.
139	FAIL	The Endpoint 1 SNI is administered to be connected to a DS1 converter, but is not physically connected to one. (The **list fiber-link** command displays a fiber link's endpoints.) If a DS1 converter should be connected to this SNI, enter **list fiber-link**, and verify that the fiber-optic and/or metallic cables are installed as assigned. If not, change administration to remove the DS1 converter complex from the SNI's fiber link by: **1** Entering **list fiber-link** to locate the fiber with this SNI as an endpoint **2** Entering **remove fiber-link** to remove the fiber **3** Entering **add fiber-link** to add the fiber back, without assigning the DS1 converter complex
140	FAIL	The Endpoint 1 SNI is physically connected to a DS1 converter but is not administered to be connected to a DS1 converter. (The **list fiber-link** command displays a fiber link's endpoints.) Either add the DS1 converter complex to the fiber that this SNI is associated with by: **1** Check for the fiber that this SNI is an endpoint of by checking **list fiber-link.** **2** **Remove fiber-link** for the fiber that this SNI is an endpoint of. **3** Add the fiber back via **add fiber-link** and this time administer the DS1 converter complex also. Or, remove the DS1 converter connection and connect the SNI directly to its administered fiber endpoint by entering **list fiber-link** and verifying that the fiber-optic and metallic cable connections are installed as administered.

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Error Code	Test Result	Description / Recommendation
202	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 2. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1, replace the SNI in slot 2.
203	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 3. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in Maintenance Procedures (555-245-103). This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 257, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 257, replace the SNI in slot 3.
204	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 4. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 513, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 513, replace the SNI in slot 4.

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Error Code	Test Result	Description / Recommendation
205	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 5. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in Maintenance Procedures (555-245-103). This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 769, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 769, replace the SNI in slot 5.
206	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 6. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1025, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1025, replace the SNI in slot 6.
207	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 7. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1281, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1281, replace the SNI in slot 7.

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Error Code	Test Result	Description / Recommendation
208	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 8. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1537, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1537, replace the SNI in slot 8.
209	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 9. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 1793, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 1793, replace the SNI in slot 9.
212	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the active SNC. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Check the error log for other SNI circuit packs in the same carrier with a 257 SNI-BD error. Use **display errors** with category PNC to view SNI-BD errors. If other SNI circuit packs in the same switch node carrier have error 257, then replace the active SNC in this switch node carrier. Replacing an SNC may be service interrupting. Refer to the SNC-BD section for the procedure for replacing an SNC. **2** Replace this SNI. **3** Replace the active SNC in the same switch node carrier.

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Error Code	Test Result	Description / Recommendation
213	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 13. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2049, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2049, replace the SNI in slot 13.
214	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 14. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2305, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2305, replace the SNI in slot 14.
215	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 15. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2561, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2561, replace the SNI in slot 15.

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Error Code	Test Result	Description / Recommendation
216	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 16. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 2817, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 2817, replace the SNI in slot 16.
217	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 17. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3073, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3073, replace the SNI in slot 17.
218	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 18. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3329, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3329, replace the SNI in slot 18.

Table 421: Test #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
219	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 19. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3585, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3585, replace the SNI in slot 19.
220	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with the equipped SNI in slot 20. (The **list fiber-link** command displays a fiber link's endpoints.) **1** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*. This should resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER Error Type 3841, replace the SNI being tested. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) To view SNI-PEER errors, use the **display errors** command with category PNC-PEER. Retry the command. **3** If the SNI being tested still has SNI-PEER Error Type 3841, replace the SNI in slot 20.
233	FAIL	No neighbor link is assigned, but the SNI (Endpoint 2) has an EI neighbor. (The **list fiber-link** command can be used to display a fiber link's endpoints.) If the SNI should have an EI neighbor: **1** Issue **add fiber-link next** to assign the fiber link's SNI to its physically connected EI neighbor. If not: **1** Remove both fiber endpoints (i.e., this SNI and its EI neighbor). **2** Issue **change circuit-pack** to remove the fiber endpoints from circuit-pack administration.
234	FAIL	No neighbor link is administered, but the SNI (Endpoint 2) has an SNI neighbor (The **list fiber-link** command can be used to display a fiber link's endpoints). **1** Administer the SNI on a fiber link to the SNI neighbor it is connected to via the **add fiber-link next** command. Or remove both fiber endpoints (i.e., this SNI and its SNI neighbor) and remove the fiber endpoints from circuit pack administration via **change circuit-pack**.

Table 421: Test #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
235	FAIL	The SNI circuit pack (Endpoint 2) cannot communicate with its neighbor. (The **list fiber-link** command can be used to display fiber link endpoints.) The SNI has an administered neighbor, but cannot communicate with its neighbor. **1** Check if the administered neighbor is inserted. If not, insert the neighbor circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.
236	FAIL	The Endpoint 2 SNI's administered neighbor does not match the physical neighbor connected. (The **list fiber-link** command displays a fiber link's endpoints.) The SNI's assigned neighbor is another SNI, but the SNI is physically connected to an EI. Enter **list fiber-link**, and verify that the fiber-optic and metallic cables are installed as administered.
237	FAIL	The Endpoint 2 SNI's administered neighbor does not match the physical neighbor connected. (The **list fiber-link** command displays a fiber link's endpoints.) The SNI's assigned neighbor is an EI, but the SNI is physically connected to another SNI. Enter **list fiber-link,** and verify that the fiber-optic and metallic cables are installed as administered.
238	FAIL	The physical location of SNI Endpoint 2's neighbor does not match its administered location. (Enter **list fiber-link** to display a fiber link's endpoints.) One location (carrier and slot) is assigned for the endpoint's neighbor, but it physically resides in another location. **1** Enter **list fiber-link**, and verify that the fiber-optic and metallic cables are installed as administered. **2** If the problem does not seem to be caused by either a physical-connection or an administration problem, replace the neighbor circuit pack. The neighbor circuit pack may have a hardware problem causing it to report a wrong angel address (physical carrier/slot address) to software.
239	FAIL	The SNI Endpoint 2 is assigned to be connected to a DS1 converter, but is not physically connected to one. (Enter **list fiber-link** to display a fiber link's endpoints.) If this SNI endpoint should be connected to a DS1 converter: **1** Issue **list fiber-link** to verify that the fiber-optic cable and/or metallic cable connections are installed as assigned. If not, change administration to remove the DS1 converter complex from the SNI's fiber link by: **1** Issuing **list fiber-link** to locate this SNI endpoint's fiber **2** Issuing **remove fiber-link** for this SNI endpoint's fiber **3** Issuing **add fiber-link** to replace the fiber **without** assigning the DS1 converter complex.

Table 421: Test #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
240	FAIL	The SNI Endpoint 2 is physically connected to a DS1 converter, but is not assigned to be connected to one. . Use **list fiber-link** to display a fiber link's endpoints. Either, replace the DS1 converter with fiber by: **1** Issuing **list fiber-link** to verify that the fiber-optic and metallic cable connections are installed as assigned **2** Disconnecting the SNI endpoint from the DS1 converter **3** Issuing **add fiber-link** to reconnect the SNI to its assigned fiber Or, add a DS1 converter complex to the SNI's fiber by: **1** Issuing **list fiber-link** to locate this SNI endpoint's fiber **2** Issuing **remove fiber-link** for this SNI endpoint's fiber **3** Issuing **add fiber-link**, both to replace the fiber **and** to assign the DS1 Converter complex
	PASS	The administered data and the circuit packs the SNI(s) can communicate with match.

Fiber Link Reset Test (#768)

This test is **destructive**.

This test resets both endpoints of the fiber link and is executed via the **reset fiber-link *F P*** command. Any DS1 converter circuit packs on the fiber link are not reset. The **reset fiber-link** command should almost never be used. It may be necessary to use it when the endpoint circuit packs enter a mode in which they cannot communicate with software. When necessary, always reset fiber endpoints with the command instead of reseating the endpoint circuit packs.

For EI-to-EI fibers that connect an IPSI PN, the EI on the PN is reset first followed by the EI on the IPSI PN. For EI-to-EI fiber links that connect two PNs, one EI is reset first followed by the other.

For an EI-SNI fiber link in which the EI is on the PN, the SNI is reset first followed by the EI.

For an EI-SNI fiber link in which the EI is on a PN, the SNI is reset first followed by the EI.

For an SNI-to-SNI fiber link, the SNI farthest from the PN is reset first followed by the SNI nearest to the PN.

When an EI endpoint is reset, the Expansion Interface Reset test (#336) is executed. When an SNI endpoint is reset, the SNI Reset test (#761) is executed. These tests are described in the EXP-INTF and SNI-BD sections.

This test starts the other reset test mentioned above and returns PASS without waiting for the results of the other reset test. For a better indication of how the other reset tests are running, use the **reset board *UUCSS*** command on each individual fiber link endpoint.

Table 422: Test #768 Fiber Link Reset Test

Error Code	Test Result	Description / Recommendation
1703	ABORT	Both fiber endpoints are in the hardware path for INLs to their respective switch node carriers and, thus, cannot get a response from this test because the INLs response should come on will go down as a result of the reset. **1** Reset the individual fiber-link endpoints via **reset board**.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	The reset of both fiber endpoints successfully completed.

Failure Audit (#777)

This test is nondestructive.

This test queries the SNI(s) on the fiber link for any existing failures and any unacknowledged cleared failure messages. Each failure generates an error and alarm entry against SNI-BD, SNI-PEER, or FIBER-LK. An unacknowledged cleared failure message is a message the SNI circuit pack sent to software indicating a previous failure is now gone and the SNI circuit pack did not receive a message from software indicating that the failure message was received by software.

If no failures are detected by the SNI circuit pack, this test will pass.

If this test reports failures, the results screen for the **test fiber-link** command will show **FAIL** with no FAIL code. The error log must then be displayed via **display errors** with category PNC to view SNI-BD and FIBER-LK errors and **display errors** with category PNC-PEER to view SNI-PEER errors.

For EI-to-EI fiber links, this test is not run. For EI-to-SNI fiber links, this test is run on the SNI circuit pack endpoint of the fiber link. For SNI-to-SNI fiber links, this test is run on both SNI circuit pack endpoints of the fiber link.

Table 423: Test #777 Failure Audit

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2300	ABORT	The downlink message necessary to run this test could not be sent.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test.
2302	ABORT	The SNI circuit pack claims that it received a bad message from software.
2303	ABORT	The SNI circuit pack claims that the test requested by software is invalid.
2304	ABORT	SNI firmware is not able to run the test. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 423: Test #777 Failure Audit

Error Code	Test Result	Description / Recommendation
2306	ABORT	An SNI circuit pack on the fiber link is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node(s) where the SNI(s) reside to verify whether the LEDs on the board(s) light. Follow the steps below for the SNI(s) from step 1 that had no LEDs light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the media server. Use **list fiber-link** to determine the fiber connections to this carrier. Check the LEDs on every SNI and EI, and fix any fiber problems. Enter **display errors** and resolve any EXP-INTF error entries associated with the PPN. Also, resolve any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
	FAIL	The SNI circuit pack reported failures or retransmitted a cleared failure message. **1** If this is the first time this test was run, run the test again. If there were any previous failure messages that software did not acknowledge, this test will FAIL even if the failure messages indicate a FAIL to PASS transition, i.e., a problem has gone away. If this test is run twice and FAILs both times, then at least one problem still exists. **2** Resolve any errors or alarms (**display errors** and **display alarms**) for SNI-BD, SNI-PEER, and FIBER-LK entries. **3** If no SNI-BD, SNI-PEER, or FIBER-LK entries exist in the error and alarm logs, retry the command.
	PASS	No problems are detected on the board.

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SNI Fiber Out of Frame Query (#989)

This test is nondestructive.

The SNI circuit pack reports whether a fiber out-of-frame condition exists, whether a loss-of-signal condition exists, and whether the lightwave transceiver is present.

Table 424: Test #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
1415	ABORT	The lightwave transceiver is absent from Endpoint 1 of the fiber link. Use **list fiber-link** to display fiber link endpoints. **1** If a lightwave transceiver should not be present (for example, an SNI connected to a DS1 converter circuit pack), do nothing. **2** Otherwise, continue with the following steps. **3** Check the lightwave transceiver connections. **4** Replace the lightwave transceiver. **5** Replace the SNI circuit pack.
1416	ABORT	The lightwave transceiver is absent from Endpoint 2 of the fiber link. Use **list fiber-link** to display fiber link endpoints. **1** If a lightwave transceiver should not be present (for example, an SNI connected to a DS1 converter circuit pack), do nothing. **2** Otherwise, continue with the following steps. **3** Check the lightwave transceiver connections. **4** Replace the lightwave transceiver. **5** Replace the SNI circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	The SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.

Table 424: Test #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
2306	ABORT	A fiber link's SNI circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node where the SNI board(s) reside to verify whether their LEDs light. If not, continue with the following steps. **2** If LEDs light on other boards in the same carrier (but not on this board), issue **test board *UUCSS* long** (#760) for the active SNC in this carrier. Wait 5 minutes, and try step 1 again. If the board's LEDs still do not light, replace the board. (Replacing an SNI may be service interrupting. Refer to the SNI-BD section for the procedure to replace an SNI.) **3** If no LEDs light on any board in the same carrier, fix any connectivity problems between this carrier and the media server. (Use **list fiber-link** to determine the fiber connections to this carrier.) Check the LEDs on every SNI and EI, and fix any fiber problems. Enter **display errors**, and resolve any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
141	FAIL	The SNI circuit pack (Endpoint 1 of the fiber link) has a fiber out-of-frame condition, but no loss-of-signal condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 424: Test #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
142	FAIL	The SNI circuit pack (Endpoint 1 of the fiber link) has a fiber out-of-frame condition, but no loss-of-signal condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
143	FAIL	The SNI circuit pack (Endpoint 1 of the fiber link) has a loss-of-signal condition, but no fiber out-of-frame condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
144	FAIL	The SNI circuit pack (Endpoint 1 of the fiber link) has a loss-of-signal condition, but no fiber out-of-frame condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 424: Test #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
145	FAIL	The SNI circuit pack (Endpoint 1 of the fiber link) has a fiber out-of-frame condition and a loss-of-signal condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
146	FAIL	The SNI circuit pack (Endpoint 1 of the fiber link) has a fiber out-of-frame condition, and a loss-of-signal condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
241	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a fiber out-of-frame condition, but no loss-of-signal condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 424: Test #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
242	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a fiber out-of-frame condition, but no loss-of-signal condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
243	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a loss-of-signal condition, but no fiber out-of-frame condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
244	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a loss-of-signal condition, but no fiber out-of-frame condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 424: Test #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
245	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a fiber out-of-frame condition and a loss-of-signal condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
246	FAIL	The SNI circuit pack (Endpoint 2 of the fiber link) has a fiber out-of-frame condition, and a loss-of-signal condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber link if no DS1 converter complex is administered (check via **list fiber-link**). Otherwise, if a DS1 converter complex is administered, the connected circuit pack is the DS1 converter circuit pack connected to the SNI circuit pack. **2** Perform the Fiber link fault isolation in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.
	PASS	No problems associated with this test are detected on the SNI.

FW-DWNLD (Firmware Download)

S8700 / S8500 / S8100

MO Name (in Alarm Log)	Alarm Level	Full Name of MO
FW-DWNLD	MINOR[1]	Firmware Download

1 MINOR alarms can be down-graded to a WARNING level per local instructions by using the **set options** command.

Firmware Download Procedures

Firmware Download gives you the capability to download new firmware to one or more programmable circuit packs of the same type residing within the same system. Programmable circuit packs have a “P” in their suffix. For example TN799DP is programmable, but TN799C is not. This programmable capability reduces the need to physically remove circuit packs and return them to Avaya for firmware updates.

NOTE:
This description contains the most accurate information available at the time of production. Go to the Avaya Support Web site (http://avaya.com/support) and look under **Software & Firmware Downloads** for the most recent information about downloading firmware.

During this firmware download process, a firmware image is installed on a circuit pack in three steps:

1. The image is copied from an Avaya server over the Web to a local “staging area” — a PC or server on the customer LAN.
2. The image is copied from the local staging area to the **source** circuit pack or media server.
3. The image is downloaded from the **source** to the **target** with one of these methods:
   - **Self-download (**Self and C-LAN-distributed download procedure on page 1015) - image downloaded directly from RAM (the **source**) to flash memory (the **target**) on the same circuit pack
   - **C-LAN-distributed download (**Self and C-LAN-distributed download procedure on page 1015) - image downloaded from RAM (the **source**) on a C-LAN circuit pack to flash memory (the **target**) on one or more separate circuit packs of the same type
   - **IPSI download (**IPSI download procedure on page 1026**)** - image downloaded from a **source** media server to one or all **target** IPSI circuit packs

Although different circuit packs have different potential roles in a firmware download, currently the following circuit packs can participate in a firmware-download procedure. Additional packs will be added in the future.

- Control LAN (C-LAN) – TN799C or TN799DP
- 2-Wire Digital Line (DIG-LINE) – TN2214CP or TN2224CP
- IP Media Processor (IPMEDPRO) – TN2302AP
- Maintenance/Test (M/T-ANL) – TN771DP
- UDS1 – TN464GP, TN2464BP, and TN2313AP

- Voice Announcements over LAN (VAL) – TN2501AP
- IP Server Interface (IPSI) – TN2312AP

In a firmware download to IPSIs, the media server is the source and the IPSIs are the targets. For downloads to all other circuit packs, see Table 425 for each circuit pack's roles in a firmware download.

Table 425: Non-IPSI Circuit-Pack Roles in Firmware Downloads

Circuit Pack	TN Code	Role in Self Download	Role in C-LAN-distributed Download
C-LAN	TN799C[1]		Source
	TN799DP[2]	Source and Target	Source
VAL	TN2501AP	Source and Target	
IP Media Processor	TN2302AP[3]		Target
DIG-LINE (2-wire)	TN2214CP		Target
	TN2224CP		Target
Maintenance/Test	TN771DP		Target
UDS1	TN464GP		Target
	TN2464BP		Target
	TN2313AP		Target

1 The TN799C C-LAN circuit pack can be the "source" for a C-LAN-distributed download but cannot be the "target" circuit pack for either a self or C-LAN-distributed download since it is not a programmable circuit pack (no "P" suffix).

2 The TN799DP can be both source and target for a self download and can be the source for a C-LAN-distributed download.

3 For TN2302AP circuit packs with a vintage less than 22, a different download procedure is required that is not described here. Go to the Avaya Support Web site under **Software & Firmware Downloads**, DEFINITY ECS, TN2302AP firmware downloads. On the page titled "Retired - (OLD Do Not Use) DEFINITY Firmware Downloads", scroll down to the TN2302AP section and click on TFTP_Firmware_download_procedure.pdf.

If you need to download new firmware to an IPSI, use the IPSI download procedure on page 1026. Otherwise, use the Self and C-LAN-distributed download procedure on page 1015.

Self and C-LAN-distributed download procedure

This section describes the procedures for either a self or C-LAN-distributed firmware download. These procedures will help you determine which method to use. The main differences between the two methods are:

C-LAN-distributed download	• The “source” circuit pack is always a C-LAN, either TN799DP or TN799C. • Multiple “target” circuit packs of the same TN code can be scheduled for download at a time.
self download	• The “source” and “target” circuit packs are the same. • Each circuit pack must be scheduled for download individually.

The high-level steps you will use to perform a self or C-LAN-distributed firmware download are:

1. Prepare for download on page 1015
2. Upload image file from Web to staging area on page 1018
3. FTP the image file to source on page 1018
4. Schedule a download to target(s) on page 1019
5. Monitor download progress on page 1023
6. Disable file system on page 1025

NOTE:
If you have any trouble with this procedure, refer to Troubleshooting firmware downloads on page 1030.

Prepare for download

The following sub-sections contain procedures to prepare for the firmware downloads to target circuit packs. These sub-sections are:

- Verify hardware/software requirements on page 1015
- Get circuit pack information on page 1017
- Set up source circuit pack’s file system on page 1018

Verify hardware/software requirements

Follow these steps to make sure you know which download procedure to use and that you have all hardware and software that is necessary to proceed:

1. Given the type of target circuit pack to be upgraded, choose an appropriate source circuit pack from the following table (Table 426). The last column indicates which download method must be used with the target and chosen source.

Table 426: Download Method by Circuit Pack

Target Circuit Pack(s)	Source Circuit Pack	Download Method
TN464GP, TN2464BP, and TN2313AP (UDS1)	TN799C or TN799DP	C-LAN-distributed
TN2214CP or TN2224CP (DIG-LINE)	TN799C or TN799DP	C-LAN-distributed
TN771DP (Maintenance/Test)	TN799C or TN799DP	C-LAN-distributed
TN2302AP (IP Media Processor)[1]	TN799C or TN799DP	C-LAN-distributed
TN799DP (C-LAN)	TN799DP	Self
TN2501AP (VAL)	TN2501AP	Self

1 For TN2302AP circuit packs with a vintage less than 22, a different download procedure is required that is not described here. Go to the Avaya Support Web site under **Software & Firmware Downloads**, DEFINITY ECS, TN2302AP firmware downloads. On the page titled “Retired - (OLD Do Not Use) DEFINITY Firmware Downloads”, scroll down to the TN2302AP section and click on TFTP_Firmware_download_procedure.pdf.

2 Make sure you have the following:

- Superuser or Services login and password to DEFINITY or Communication Manager
- PC or other server with the following:
  - IP connectivity to the source board
  - Web browser that the media server web interface supports
  - IP connectivity to the World-Wide Web
  - File transfer protocol (FTP) software program

NOTE:
Some GUI-based FTP applications are incompatible with Communication Manager/DEFINITY. Command-line FTP applications launched from a UNIX shell or DOS prompt work best.

NOTE:
If you need to distribute firmware from a source C-LAN to target boards on a DS1-C (DS1 converter complex) remote port network, then make sure there is a clear channel between the source C-LAN and those target boards:

- At the SAT, enter **list fiber-link** and find the link between the source C-LAN and the target boards.
- Enter **display fiber-link *n***, where ***n*** is the fiber link’s number.

- Go to the second page of the Fiber Link Administration screen and verify that the `Line Coding` fields are set to **b8zs** for T1 facilities and **hdb3** for E1 facilities.
- If they are not, then escalate before proceeding with the firmware download.

Get circuit pack information

1 At the SAT, enter **list configuration all**.

The System Configuration screen (Screen 74) appears.

Figure 74: System Configuration screen

```
list configuration all

                            SYSTEM CONFIGURATION

Board                                                      Assigned Ports
Number Board Type              Code     Vintage    u=unassigned t=tti p=psa

01A08  IP MEDIA PROCESSOR      TN2302AP HW03 FW044 01 02 03 04 05 06 07 08

01A04  CONTROL-LAN             TN799DP  HW00 FW005 u  u  u  u  u  u  u  u
                                                   u  u  u  u  u  u  u  u
                                                   17

01B04  DS1 Interface           TN464GP  HW02 FW006 01 02 03 04 05 06 07 08
                                                   09 10 11 12 13 14 15 16
                                                   17 18 19 20 21 22 26 24
                                                   u  u  u  u  u  u  u  u
01B05  DS1 Interface           TN464GP  HW02 FW006 01 02 03 04 05 06 07 08
                                                   09 10 11 12 13 14 15 16
                                                   u  u  u  u  u  u  u  u
                                                   u  u  u  u  u  u  u  u
01B06  DS1 Interface           TN464F   000038     01 02 03 04 05 u  u  u
                                                   u  u  u  u  u  u  u  u
                                                   u  u  u  u  u  u  u  u
                                                   u  u  u  u  u  u  u  u

01A10  VAL-ANNOUNCEMENT        TN2501AP HW01 FW004 01 02 03 04 05 06 07 08
                                                   09 10 11 12 13 14 15 16
                                                   17 18 19 20 21 22 26 24
                                                   25 26 27 28 29 30 31 32
                                                   33
```

2 Look for the target circuit pack(s). If the suffix in the `Code` field does not have a “P” (e.g., TN2302AP), a firmware download is not possible.

3 Look for the firmware vintage(s) in the `Vintage` field of the target circuit pack(s) to see if a firmware download is needed.

4 Record the UUCSS address in the `Board Number` field of each source and target circuit pack.

5 If a C-LAN is the source, make sure port 17 is assigned on that C-LAN. If it is not assigned, administer the port using the SAT command **add data-module *UUC17***.

6 For a self download to a VAL board, make sure that port 33 is assigned on the VAL board. If it is not assigned, administer the port using the SAT command **add data-module *UUC*33**.

7 Determine the IP address of the source circuit pack. You can either ask the data systems administrator or enter the following SAT command sequence:

a Type **display ip-interfaces**. Find the source circuit pack’s `Slot` location and write down its `Node Name`.

b Type **display node-names ip**. Find the source circuit pack's `Node Name` and write down its `IP Address`.

Set up source circuit pack's file system

Before files can be copied to the source circuit pack, you must set up a file system on the source circuit pack to accept the files.

1. Log into the SAT using a superuser or services login and password.
2. Enter **enable filesystem board *UUCSS* login *ftplogin ftppassword***, where:
   - ***UUCSS*** is the location of the source circuit pack.
   - ***ftplogin*** is any temporary login ID that you choose for this FTP session (for example, ***denver***).
   - ***ftppassword*** is any password that you choose for this FTP session (for example, ***broncos***). The password must be at least 7 characters long.

   Later, you will use this same ***ftplogin*** and ***ftppassword*** in the following section, FTP the image file to source.

This completes the preparation for a firmware download.

Upload image file from Web to staging area

For an upload from the Web, you need a temporary staging area to store the firmware images before downloading them to a circuit pack. Although the staging area is often on a PC platform, you can also use other server types, such as a UNIX platform or a Linux-based media server.

1. Go to the Avaya Support Web site (http://avaya.com/support). Follow the **Software & Firmware Downloads** link and the subsequent links for your product and the target circuit pack TN code.
2. Find the section for the firmware vintage you want. Unless otherwise instructed, choose the highest vintage.
3. Be sure to read that vintage's ReadMe file before downloading the image file(s).
4. For each image file that the ReadMe file indicates should be downloaded for that circuit pack and vintage, do the following:
   a Click on the image file name.
   b Save this file to disk in a local staging area directory.
   c Write down the path to the local staging area and the filename of the firmware image. You will need to enter this information later.

FTP the image file to source

The following steps are generic to most FTP programs.

1. From the laptop, PC, UNIX, or Linux system where the local staging area is, bring up a DOS interface or UNIX/Linux shell.
2. Ensure that the new firmware image file is in the local staging area directory:
   a Change the directory to the staging area:

   cd *lyour-staging-area*

b List the contents of the directory showing the most recent files last using **ls -ltr** on Linux/UNIX or **dir /od** on DOS.

3 Use FTP to copy the firmware image file(s) to the source:

a Enter **ping ip_address** to verify a communication link to the source board, where ***ip_address*** is the IP address of the source board.

b Enter **ftp ip_address** to enter the FTP interface with a link to the source.

c Log into the FTP session with the same ***ftplogin*** and ***ftppassword*** that you set up in the Set up source circuit pack's file system section.

d Enter **binary**. This requests that files be transferred in binary format.

CAUTION:
Files will be corrupted during transfer if you don't enter this **binary** command.

e If you are self downloading to a TN2501AP (VAL) circuit pack, enter:

cd /

This command moves you from the announcement directory (default for an FTP session on the VAL board) to the root directory ("/"), where firmware and other files reside. This will keep the firmware image file separate from the announcement files.

f Enter **put *filename.ext***. This command copies the new firmware image file to the source directory in RAM.

g Enter **ls** to verify that the new firmware image file is on the circuit pack.

h Enter **bye**. This ends the FTP session.

Schedule a download to target(s)

You can schedule the download to occur immediately or at a later date and time. The procedures for self and CLAN-distributed download methods differ at this step.

1 Enter **change firmware download** and fill in the fields as described in Table 427.

If you are performing a self download, you will be entering only one target board location and it will be the same as the source board location. Screen 75 provides an example of self download.

If you are performing a CLAN-distributed download, you will be entering a C-LAN location as the source and 1 - 50 target locations, where the target boards are all of the same type. Screen 76 provides an example of a C-LAN-distributed download.

a Example screen for a self download to a VAL board.

Figure 75: Firmware Download Screen for a Self Download

```
change firmware download                                    Page   1 of    1
                                FIRMWARE DOWNLOAD
   Source Board Location: 01A10
Firmware Image File Name: tn2501ap_f05.bin
       Target Board Code: TN2501 Suffix: AP Firmware Vintage:
       Schedule Download? y    Remove Image File After Successful Download? y
   Start Date/Time: 09/12/2002 13:30    Stop Date/Time: 09/12/2002 16:30

    Target          Target          Target          Target          Target
   Location        Location        Location        Location        Location
 1. 01A10       11. _____       21. _____       31. _____       41  _____
 2. _____       12. _____       22. _____       32. _____       42  _____
 3. _____       13. _____       23. _____       33. _____       43. _____
 4. _____       14. _____       24. _____       34. _____       44. _____
 5. _____       15. _____       25. _____       35. _____       45. _____
 6. _____       16. _____       26. _____       36. _____       46. _____
 7. _____       17. _____       27. _____       37. _____       47. _____
 8. _____       18. _____       28. _____       38. _____       48. _____
 9. _____       19. _____       29. _____       39. _____       49. _____
10. _____       20. _____       30. _____       40. _____       50. _____

Enter 5 character board number; cabinet(1-30):carrier(A-E):slot(0-20
```

b Example screen for a C-LAN-distributed download to two UDS1 boards.

Figure 76: Firmware Download Screen for a C-LAN-distributed Download

```
change firmware download                                    Page   1 of    1
                                FIRMWARE DOWNLOAD
   Source Board Location: 01A04
Firmware Image File Name: usd1v22r1
       Target Board Code: TN464  Suffix: GP Firmware Vintage:
       Schedule Download? y  Remove Image File After Successful Download? y
   Start Date/Time: 10/08/2002  22:00    Stop Date/Time: 10/08/2002  22:30

Target          Target          Target          Target          Target
Location        Location        Location        Location        Location
 1. 01B04       11. _____       21. _____       31. _____       41  _____
 2. 01B05       12. _____       22. _____       32. _____       42  _____
 3. _____       13. _____       23. _____       33. _____       43. _____
 4. _____       14. _____       24. _____       34. _____       44. _____
 5. _____       15. _____       25. _____       35. _____       45. _____
 6. _____       16. _____       26. _____       36. _____       46. _____
 7. _____       17. _____       27. _____       37. _____       47. _____
 8. _____       18. _____       28. _____       38. _____       48. _____
 9. _____       19. _____       29. _____       39. _____       49. _____
10. _____       20. _____       30. _____       40. _____       50. _____

Enter 5 character board number; cabinet(1-30):carrier(A-E):slot(0-20)
```

Table 427, Firmware Download fields and descriptions, on page 1021 gives the field descriptions for the Firmware Download screen.

Table 427: Firmware Download fields and descriptions

Field	Description	Notes
Source Board's Location	The UUCSS address of the source circuit pack.	For a self download, the same board is the source board and target board. For a C-LAN-distributed download, this is the source C-LAN location.
Firmware Image File Name	The complete filename of the new firmware image file. If **list directory board** showed that the file had an extension, such as .bin, include the extension.	
Target Board Code	The circuit pack ID. For example, TN2501 Do not type the suffix, such as AP, D", or GP.	Enter the TN code of the target circuit pack(s). For a self download, this is the same as for the source circuit pack.
Suffix	Examples: • For VAL (TN2501AP), **AP**. • For C-LAN (TN799DP), **DP**. • For DS1 (TN464GP), **GP**.	
Firmware Vintage	This is blank. It shows a value in the Firmware Download screen of a **display firmware download** or a **status firmware download**.	
Schedule Download	Type **y** to schedule the firmware download for another time. Type **n** to start the firmware download immediately after completing the screen.	Once the firmware download begins, you cannot make any changes to this screen. You can only disable this schedule using **disable firmware download** and then start a new one. (See Aborting a firmware download on page 1030 for instructions.) If you answer **n**(o), then the Start Date/Time and Stop Date/Time fields disappear. The download begins as soon as you press Enter.

1 of 2

Table 427: Firmware Download fields and descriptions

Field	Description	Notes
`Remove Image File After Successful Download`	Type **y** if you want the procedure to automatically remove the new firmware image file [default]. Type **n** if you do not want the new firmware image file removed.	At the completion of a successful download, the procedure automatically removes the new firmware image file from the source file system, freeing up the memory on the source circuit pack. We recommend using the default setting. If field is set to **n**, you must manually remove the new firmware image file from the source file system after the download has completed. (See Disable file system on page 1025 for instructions.)
`Start Date/Time`	Type the date and time that you want the firmware download to begin.	
`Stop Date/Time`	Type the date and time that you want the firmware download to end.	If the scheduled stop time is reached before the new firmware image file has been downloaded to every circuit pack, the system finishes downloading to the circuit pack in progress before aborting the remainder of the download schedule.
`Target Location`	Type the UUCSS address of the circuit pack that you are updating.	For a self download, this circuit pack must reside in the same location as the source pack. For a C-LAN-distributed download, enter up to 50 locations — these must all be the same type of circuit pack.

2 of 2

2 Submit the schedule.

If you set the `Schedule Download` field to **n**, the download starts as soon as you submit the schedule.

NOTE:
If you are scheduling firmware downloads for a circuit pack that is designated as primary/secondary sync (timing) source (for example, TN464GP), this procedure automatically redesignates a local timing source during the download. After the download is complete and the circuit pack is returned to service, the procedure designates the original circuit pack as the timing source.

NOTE:
The target circuit packs are automatically removed from service while the firmware is downloaded to them and automatically returned to service after the download is completed. While a circuit pack is removed from service, any active calls through that circuit pack are dropped.

NOTE:
If you receive a SAT error message asking you to use the command, **test firmware download**, this means that there was a problem with a previous firmware download. Run the test before proceeding.

CAUTION:
Unless the `Remove Image File After Successful Download` field is set to **y**, the ***ftplogin*** and ***ftppassword*** remain on the TN799DP or TN799C (C-LAN) circuit packs either until they are reset or until you issue the **disable filesystem board *UUCSS*** command. The same is true for the TN2501AP (VAL) circuit pack, except as noted below.

NOTE:
In systems running on DEFINITY R9.5, or R10 software loads older than R10 field trial load 40 (R010.01.040.0), or any Communication Manager 1.1, the TN2501AP circuit pack must be re-seated in the carrier/slot in order for the new firmware image to take effect. Re-seating of the circuit pack is NOT necessary in any Communication Manager 1.2 or later systems.

3 If the download is scheduled for later, ensure that the download will run as you intend.

a Enter **test firmware download**.

If the download has already begun, the test will be denied.

The Figure 77, Test Results screen, on page 1023 appears.

Figure 77: Test Results screen

```
test firmware download                                          SPE A

                                TEST RESULTS

Port        Maintenance Name  Alt. Name Test No. Result          Error Code

            FW-DWNLD                    1413     PASS
```

b Look in the `Result` field for `FAIL` conditions.

c If the test does not pass, refer to Test Firmware Download (#1413) in *Maintenance Alarms Reference (555-245-102)*. Resolve every error and re-run the test (**test firmware download**).

When the test passes, every specified resource is *currently* available for the scheduled download. Note, however, that this does *not* guarantee the resource will still be available at the time of the download.

Monitor download progress

You can check the progress of a firmware download with this procedure.

1 Enter **status firmware download**.

The Status Firmware Download screen displays.

2 If this screen is blank after issuing the command, the download has completed; go to Step 4.

3 Check the `St` (status) field immediately to the right of the `Target Location` field to view the progress of the firmware update:

- **(P)**ending
- **(C)**ompleted
- **(F)**ailed
- **(A)**borted

4 Enter **status firmware download last**.

This allows you to view the progress of the last completed firmware update or the entire schedule if it is completed. Notice in Figure 78, Status Firmware Download Last screen, on page 1024 that the `Start` and `Stop` times now reflect the actual start and stop times of the download schedule and the `Firmware Vintage` now reflects the vintage that was downloaded.

Figure 78: Status Firmware Download Last screen

```
status firmware download last

                          STATUS FIRMWARE DOWNLOAD

   Source Board Location: 01A04
Firmware Image File Name: usd1v22r1
       Target Board Code: TN464   Suffix: GP  Firmware Vintage: 8
       Schedule Download? y   Remove Image File After Successful Download? y
   Start Date/Time: 10/08/2002  22:00    Stop Date/Time: 10/08/2002  22:02

    Target          Target          Target          Target          Target
   Location St     Location St     Location St     Location St     Location St
 1. 01B04   C   11.             21.             31.             41.
 2. 01B05   C   12.             22.             32.             42.
 3.             13.             23.             33.             43.
 4.             14.             24.             34.             44.
 5.             15.             25.             35.             45.
 6.             16.             26.             36.             46.
 7.             17.             27.             37.             47.
 8.             18.             28.             38.             48.
 9.             19.             29.             39.             49.
10.             20.             30.             40.             50.
Status: Pending(P) Completed(C) Failed(F) Aborted(A)
```

5 If one or more downloads fail, enter **test firmware download** to resolve the errors and clear the alarms. For more information about the test that is run and the troubleshooting procedures to use if the test does not pass, see Test Firmware Download (#1413) in *Maintenance Alarms Reference (555-245-102)*.

6 For TN2501AP (VAL) circuit packs running Communication Manager Release 1.1 (see Note below), reseat the TN2501AP to reset the board after the download is complete by following these steps:

NOTE:
In systems running on DEFINITY R9.5, or R10 software loads older than R10 field trial load 40 (R010.01.040.0), or any Communication Manager 1.1, the TN2501AP circuit pack must be re-seated in the carrier/slot in order for the board firmware upgrade to take effect. Re-seating of the circuit pack is NOT necessary in any Communication Manager 1.2 or later systems.

WARNING:
To prevent electrostatic discharge (ESD), be sure to wear a grounding strap while handling the circuit pack.

CAUTION:
Ensure that both the top green and top amber LEDs on the TN2501AP are out.

a Release the latch handle to free the TN2501AP from the carrier.

b Pull the circuit pack out approximately 1 – 2 inches (~ 3 – 5 cm).

c Re-insert the circuit pack into the carrier.

d Close the latch securely.

7 If you set the `Remove Image File After Successful Download?` field on the ***Firmware Download*** screen to **y**, then the download procedure is now complete.

If you set it to **n**, then proceed to the next section, Disable file system on page 1025, to manually remove the firmware image and disable the file system on the source circuit pack.

Disable file system

Performing the following steps on the TN799DP (C-LAN) or TN2501AP (VAL) circuit packs removes only the ***ftplogin*** *and the* ***ftppassword****. The allocated memory for the file system remains reserved for the session.*

To free up resources on the source circuit pack, you must delete the new firmware image files and disable the file system.

1 From the SAT, enter **remove file board *UUCSS filename.ext*** to remove the image file from the source board.

2 Enter **list directory board *UUCSS***. The List Directory screen appears.

3 Verify that the new firmware image file is ***not*** listed in the `File/Directory Name` field.

4 Enter **disable filesystem board *UUCSS*** to disable the file system on the source circuit pack.

NOTE:
This command is successful only if no files remain on the source circuit pack.

This completes the self and C-LAN-distributed download procedures.

IPSI download procedure

This procedure allows you to update either one or every IPSI target circuit pack using a new firmware image file obtained from the Web and copying it to a local staging area, then to a media server, then to the IPSI(s).

To update firmware on an IPSI, follow these procedures:

1. Prepare for IPSI download on page 1026
2. Copy firmware from Web to staging area on page 1027
3. Upload firmware from staging area to server on page 1027
4. Download firmware from server to IPSI on page 1028
5. Activate new firmware on IPSI on page 1028.

NOTE:
If you have trouble with any of these procedures, refer to Troubleshooting firmware downloads on page 1030.

Prepare for IPSI download

Do the following before beginning the download:

1. Make sure you have the following:
   - Superuser or Services login and password
   - PC or other server with the following:
     - IP connectivity to the media server
     - IP connectivity to the World-Wide Web
     - Web browser supported by the media server Web interface
2. Determine what the latest available IPSI vintage is:
   a. From your browser, go to the Avaya Support website at http://avaya.com/support. Follow the **Software & Firmware Downloads** link and the subsequent links for your product and the TN2312AP.
   b. From the list of available TN2312AP vintages, find the latest (highest) vintage.
   c. Keep this browser window up. You will need it for another step.
3. Determine what vintage the IPSIs have now:
   a. Bring up another browser window.
   b. Go to either media server's Web interface and log in.
   c. Under the IPSI Firmware Upgrade section, select **View IPSI Version**.
   d. Select **Query All** and click **View IPSI Version**.
   e. Write down the IPSI Name of each IPSI whose version (**FW#**) is not up to date, or print the whole page.
4. Determine the board location of each IPSI that needs to be upgraded. For high- and critical-reliability configurations, also determine which of the IPSIs are active and which are standby:
   a. Open up a SAT interface to the active media server.

b Enter **list ipserver-interface**. The results will give you a mapping between the `IPSI Name` obtained in the previous step and the board locations of the IPSIs (`Bd Loc`).

NOTE:
The `IPSI Name` on the ***View IPSI Version*** Web page and the `Host Name` on the ***IP Server Interface Information*** SAT screen are different names for the same data.

c Write down the board locations (`Bd Loc`) and, for a high- or critical-reliability configuration, which IPSIs are active and which are standby (`Control State`), or print the whole page.

5 Keep both browser windows up for the steps that follow.

You are now ready to begin the download procedure.

Copy firmware from Web to staging area

The new firmware image file needs to be copied from the Avaya Support Web site to a local staging area. Although the staging area is often on a PC platform, you can also use other server types, such as a UNIX workstation or a Linux-based media server.

1 Return to the Avaya Support Web site with the TN2312AP firmware images.

2 From the list of available IPSI firmware vintages, find the desired IPSI vintage.

3 Read that vintage's ReadMe file for important notices.

4 Click on the firmware image file name and save it to disk on your PC or workstation.

5 Remember the path of this local staging area and the name of the file. They will be used in the next set of steps.

6 You may close the Avaya Support Web site window if you wish.

The IPSI firmware image is now in a local staging area.

Upload firmware from staging area to server

Upload the firmware image from the local staging area to the active media server by following these steps:

1 From the media server's Web interface under the Miscellaneous section, select **Upload Files to Server**.

2 Enter the full path of the firmware image file in the staging area, or browse to the image file. Then click **LOAD FILE**. This step places the file in the default path on the server (/var/home/ftp) as required for the next step.

For help in filling out the fields or for troubleshooting problems, click **About This Screen**.

3 The results screen appears. Confirm that the image file was uploaded successfully to the media server.

You can also double check that the file is on the server by bringing up a Linux shell on the server and entering **ls /var/home/ftp -ltr**. This will list the files in the default directory with the most recent file listed last.

The IPSI firmware image is now on the active media server.

Download firmware from server to IPSI

Copy the new firmware image from the media server to one or more IPSIs by using the media server's Web interface as described in the procedure below. If you have trouble with these recommended procedures, there is an alternative Linux procedure described in Linux procedure to download IPSI firmware on page 1031.

CAUTION:
This set of steps will *not* disrupt call service unless a reset (e.g. power failure) of the active IPSI occurs. A reset would activate the new firmware image and may disrupt call service. To avoid that possibility, perform these steps during a low traffic period or, on a high- or critical-reliability system, perform these and the next section's steps on the standby IPSIs only, interchange the IPSIs, then perform them on the remainder of the IPSIs.

Perform this procedure for each IPSI individually or once for all:

1. Under the ***IPSI Firmware Upgrade*** section, select **Download IPSI Firmware.**
2. Select the start time for download, the target IPSI or all IPSIs, and **Use This File**. Enter the full path of **/var/home/ftp/filename.ext**, where ***filename.ext*** is the name and extension of the IPSI firmware image file.

   CAUTION:
   Do **not** select **Use Default File Name and Default Location**. Although the file is in the default directory, the file name is not the default, so it must be specified in **Use This File**.

   For more help on this page's selections, click **About This Screen**.
3. Click **Download Firmware**. You will see a results screen which will say:

   ```
   IPSI firmware download started
   ```
4. View the download status while the download is active or after the download is complete by selecting **View Download Status** under the ***IPSI Firmware Upgrade*** section. This page will tell you the current status, the schedule of future downloads, and the history of previous downloads. When the download is done, it will say:

   ```
   An IPSI firmware download is not currently active
   ```

   From the **View Download Status** page you can also cancel the download with the **Cancel Downloads** button. This button will finish the currently active download to an IPSI and then cancel the remainder of the IPSI download schedule.

   To backout of a completed IPSI download and revert to a previous IPSI version, follow the steps in Reverting to an older TN2312AP vintage on page 1034.

Activate new firmware on IPSI

Activate the new firmware on the IPSI(s) by using Web interface "activate" procedure described below. If you have trouble with this recommended procedure, there is an alternative Linux procedure described in Linux procedure to activate new IPSI firmware on page 1033.

CAUTION:
In a duplex-reliability system (one IPSI per PN), activating/resetting IPSI circuit packs can disrupt service. To minimize this disruption, schedule IPSI resets to execute during off-peak usage.

NOTE:
In a high- or critical-reliability system (two IPSIs per PN), service disruption can be avoided by activating/resetting only the *standby* IPSIs, interchanging the active and standby IPSIs, and then activating/resetting the new standby IPSIs.

For a duplex-reliability system, schedule the following for all IPSIs at once during off-peak so as to minimize disruption to call service. For a high- or critical-reliability system, perform the following for each *standby* IPSI individually.

1. From the media server's Web interface under the ***IPSI Firmware Upgrades*** section, select **Activate IPSI Upgrade**.
2. For a duplex-reliability system, select **All IPSIs** and **Start At** and specify a low traffic period in the date and time fields.

   For a high- or critical-reliability system, select **IPSI cabinet number __ carrier ID __** and enter a standby IPSI's location. Also select **Begin Activation Now**.

   For help on this screen, click **About This Screen**.
3. Click **Activate IPSI Upgrade**. It displays:

   ```
   IPSI Firmware Activation started
   ```
4. Monitor the progress of the activation by repeatedly selecting **View Firmware Activation Status** from the ***IPSI Firmware Upgrade*** section until it says

   ```
   Not currently active
   ```

   This indicates that the activation is complete.
5. Confirm that the IPSIs are now running the new firmware by selecting **View IPSI Version** from the ***IPSI Firmware Upgrade*** section.

For a duplex-reliability system, the IPSI download procedure is now complete.

For a high- or critical-reliability system, you still need to upgrade the active IPSIs. Follow the steps outlined in Interchange IPSIs and upgrade remainder on page 1029.

Interchange IPSIs and upgrade remainder

In high- and critical-reliability configurations, the previous steps will have only upgraded the standby IPSIs. This section will upgrade the remainder of the IPSIs by interchanging the IPSIs and performing the same download and activation procedures on the newly standby IPSIs.

Do the following from the SAT:

1. Enter **list ipserver-interface**. Make sure that each standby IPSI has a `State of Health` of `0.0.0`.

   If any have something other than `0.0.0`, view the active alarms by entering **display alarms** and resolve them before proceeding.

   CAUTION:
   If an IPSI has health problems, you should **not** interchange to that IPSI. Interchanging to an unhealthy IPSI could bring down all the calls on that PN.

2. For each healthy *standby* IPSI listed, do the following:

   a. Set the standby IPSI as the new active IPSI by entering **set ipserver-interface *UUC***, where ***UUC*** is the location of the standby IPSI. This will force an interchange from the active to the standby IPSI.

   b. Make sure the new active IPSI is still healthy by entering **list ipserver-interface** again. The `State of Health` field should still be `0.0.0`.

3. All the IPSIs should now be interchanged so that the active IPSIs are running the new version of firmware and the standby IPSIs are still running the old version.

4. Upgrade the standby IPSIs by performing the steps in both of these preceding sections on each standby IPSI:

   - Download firmware from server to IPSI on page 1028
   - Activate new firmware on IPSI on page 1028

This completes the IPSI download procedure for high- and critical-reliability configurations.

Troubleshooting firmware downloads

This section contains these troubleshooting subsections:

- Aborting a firmware download
- Testing firmware download
- Linux procedure to download IPSI firmware
- Linux procedure to activate new IPSI firmware
- Backing out of firmware download

Aborting a firmware download

You can only abort (disable/cancel) a scheduled download that has not yet started. Any download currently in progress to a circuit pack will finish. For example, if you had scheduled a C-LAN distributed download to multiple targets and the download was in progress to the first circuit pack when you disabled the download, then the download would stop after the completion of the first circuit pack's download and the remainder of the circuit packs would not receive the download.

To abort a self or C-LAN-distributed firmware download, enter the SAT command **disable firmware download**.

To abort an IPSI firmware download, select **View Download Status** from the Web interface under the ***IPSI Firmware Upgrades*** section and click **Cancel Downloads**.

Testing firmware download

To test a self or C-LAN-distributed firmware download either before a scheduled download has begun or after an attempted download has reported errors:

1 At the SAT, enter **test firmware download**.

Figure 79, Test Results screen, on page 1031 appears.

Figure 79: Test Results screen

```
test firmware download                                          SPE A

                                TEST RESULTS

Port        Maintenance Name  Alt. Name Test No. Result          Error Code

            FW-DWNLD                    1413     PASS
```

The example in Test Results screen shows PASS in the `Result` field, indicating a successful test of the firmware download circuitry.

2 If the test does not pass, refer to Test Firmware Download (#1413) in *Maintenance Alarms Reference (555-245-102)*.

Linux procedure to download IPSI firmware

The recommended method for downloading firmware from a media server to IPSIs is via the media server Web interface procedure described in Download firmware from server to IPSI on page 1028. If you have trouble using that procedure, you can follow this alternate procedure that uses Linux commands instead:

1 At the SAT, enter **go shell** to access the Linux command line.

2 Log into the media server's Linux shell with a services- or superuser-level login ID and password.

3 Change directory to the default location using **cd /var/home/ftp**.

4 Enter the **woodpiles** command to invoke FTP either to:

— Copy the firmware image from its default location on the server to *one* IPSI circuit pack using:

loadipsi -f *./filename* -c *UUC*

or to *every* IPSI (one at a time, in the order recorded in the server's `/etc/hosts` file) using:

loadipsi -f *./filename* -a

— Schedule an IPSI copy operation using the **-s** option:

loadipsi -f *./filename* -a -s *mmddyyyyhh:mm*

NOTE:
Enter **loadipsi -?** for more information about this command's syntax and options.

5 You will first see:

```
Burning flash may take several minutes...
```

When the download is complete, you will see:

```
Burning flash may take several minutes......done

All done: Success
```

If the download failed, you may see one of the errors listed in Table 428, IPSI firmware download error messages, on page 1032:

Table 428: IPSI firmware download error messages

Error Message from loadipsi Command	Description/Recommendation
IPSI Related Error: Higher/same version for ipsi board. Download Stop.	Occurs after trying to download a file with a lower firmware version than the file currently on the IPSI board. Only a higher or the same version is allowed unless the **-r** option is used with the **loadipsi** command. **1** If you intended to download an older vintage, then use the **-r** option with the **loadipsi** command as described in Reverting to an older TN2312AP vintage on page 1034. **2** If you did not intend to download an older vintage, then perform the steps again using the vintage you intended.

1 of 2

Table 428: IPSI firmware download error messages

Error Message from loadipsi Command	Description/Recommendation
IPSI Related Error: copy2flash: FAIL	The file could be corrupted perhaps due to forgetting to use FTP's binary mode. If you used **Upload Files to Server** on the Web interface, then the **binary** command is automatically used. **1** Upload the files from the server to the IPSI again. If you think that the image files on the server may also be corrupted, then redo all the steps starting with copying firmware from the Web to the staging area. **2** If you are *not* using **Upload Files to Server** on the Web interface, but are manually FTP'ing the files to the server, then be sure to use the **binary** command before the **get** command.
System Error: Connect to check IPSI board version: Error firmware version xx, board version: yy	Occurs when the IPSI is resetting. **1** Wait until the IPSI comes back up. **2** Reissue the **loadipsi** command
System Error: Image file: No such file or directory. System Error: Image file error.	Occurs when the specified file is not in the specified directory. **1** Make sure the current directory is /var/home/ftp or type **cd /var/home/ftp** to change to that directory. **2** Make sure the image file is in /var/home/ftp. Type **ls -ltr** on Linux or **dir /od** on DOS to list the files in the current directory with the most recent file last. **3** Reissue the **loadipsi** command.

2 of 2

Linux procedure to activate new IPSI firmware

The recommended method for activating new firmware on the IPSIs is via the media server Web interface procedure described in Activate new firmware on IPSI on page 1028. If you have trouble using that procedure, you can follow this alternate procedure that uses Linux commands instead:

For a duplex-reliability configuration, perform the following for all IPSIs during a low traffic period. For high- and critical-reliability configurations, perform the following on each of the standby IPSIs only.

1. At the SAT, enter **go shell** to access the Linux command line.
2. Log into the media server's Linux shell with a services- or superuser-level login ID and password.
3. Enter a Linux **resetipsi** command to reset either:
   - One standby IPSI at a time, using **resetipsi -c *UUC***
   - Every IPSI, using **resetipsi -a**

— Schedule a reset of all IPSIs using the **-s** option:

resetipsi -a -s *mmddyyyyhh*:*mm*

CAUTION:
On duplex-reliability systems, stable calls will be moved to an EI EAL fallback configuration, but unstable calls will be dropped.

NOTE:
Enter **resetipsi -?** for more information about this command's syntax and options.

4 Check that the IPSI has the new firmware version with

ipsiversion -c *UUC*

5 Check the health of the IPSI by entering at the SAT:

list ipserver-interface

The `State of Health` field should be `0.0.0`. Resolve any health problems.

This completes the IPSI download procedure for duplex-reliability configurations. For a high- or critical-reliability configuration, you still need to upgrade the active IPSIs. Follow the steps outlined in Interchange IPSIs and upgrade remainder on page 1029.

Backing out of firmware download

To back out of a completed firmware download and revert to the previous image, for all circuit packs except TN2312AP (IPSI), TN799DP (C-LAN) and TN2501AP (VAL), you follow the same download procedure you did before, except use the previous firmware vintage instead.

For backing out of an IPSI download, see Reverting to an older TN2312AP vintage on page 1034. For backing out of a C-LAN or VAL download, see Reverting to an older TN799DP or TN2501AP vintage on page 1035.

Reverting to an older TN2312AP vintage

As the server copies firmware to an IPSI during an IPSI download, its previous firmware is overwritten. Therefore, to restore the previous firmware image file the old firmware must be downloaded.

At a high level, copying, downloading and activating a previous image of firmware has the same steps as in IPSI download procedure on page 1026, *except* for:

1 When downloading a previous firmware image from the Web to a directory on the active media server, follow the steps described in Upload firmware from staging area to server on page 1027, but be sure to select the firmware image that was on the IPSI before the upgrade.

2 When copying the previous image from the server to the IPSI(s), follow the steps described in Download firmware from server to IPSI on page 1028, but also:

- If using the media server's Web interface, be sure to select on the ***Download IPSI Firmware*** page:

  Continue with download even if version is older than the version currently installed

- If using the alternate Linux command line method, be sure to use the **-r** option with the **loadipsi** command to download without comparing the new version with the existing version. For instance, to copy the previous image to every IPSI you would enter

  loadipsi -f /var/home/ftp/*filename* -a -r

The activate step is the same as described in Activate new firmware on IPSI on page 1028.

Reverting to an older TN799DP or TN2501AP vintage

To revert back to the old firmware image file on a *TN799DP (C-LAN) or TN2501AP (VAL) only*:

1 At the SAT, enter **get boot-image *UUCSS*** to check the status of the firmware images on the target circuit pack.

The Display Firmware Image(s) report (Figure 80, Display Firmware Image(s) screen, on page 1035) appears.

Figure 80: Display Firmware Image(s) screen

```
get boot-image 1C07

                          DISPLAY FIRMWARE IMAGE(S)

              Image 1         Image 2

  Board Type: TN2501          TN2501
  FW Vintage: 02              01
HW Signature: 02              02
      Suffix: A               A
        Date: 09/13/02        05/06/02
   Timestamp: 10:30:50        12:42:18
CRC Checksum: Good            Good
Active Image: Yes             No
Reboot Image: Yes             No
```

a Check Image 1 and Image 2 to see where the active image resides.

b Check the date and time stamps to determine whether to revert back to `Image 1` or `Image 2`.

In the following example, we are reverting back to Image 2, because it has the older date and time stamp.

NOTE:
In most cases, the image with the more recent date and time stamp is the new firmware image file.

2 At the SAT, enter **set boot-image board *UUCSS* image 1 | 2**.

Example: **set boot-image board 1C07 image 2**

The system responds with

```
Command Successfully Completed
```

3 At the SAT, enter **get boot-image *UUCSS*** to check the status of the firmware images on the target circuit pack.

Figure 81, Display Firmware Image(s) screen, on page 1036 appears.

Figure 81: Display Firmware Image(s) screen

```
get boot-image 1C07

                          DISPLAY FIRMWARE IMAGE(S)

              Image 1         Image 2

  Board Type: TN2501          TN2501
  FW Vintage: 02              01
HW Signature: 02              02
      Suffix: A               A
        Date: 09/13/02        05/06/02
   Timestamp: 10:30:50        12:42:18
CRC Checksum: Good            Good
Active Image: Yes             No
Reboot Image: No              Yes
```

Note that the values in the `Reboot Image` field has changed.

4 Reseat the circuit pack to activate the new firmware image:

NOTE:
In systems running on DEFINITY R9.5, or R10 software loads older than R10 field trial load 40 (R010.01.040.0), or any Communication Manager 1.1, the TN2501AP circuit pack must be re-seated in the carrier/slot in order for the new firmware image to take effect. Re-seating of the circuit pack is NOT necessary in any Communication Manager 1.2 or later systems.

WARNING:
To prevent electrostatic discharge (ESD), be sure to wear a grounding strap while handling the circuit pack.

CAUTION:
For a TN2501AP VAL circuit pack, ensure that both the top green and top amber LEDs are out.

- **a** Release the latch handle to free the circuit pack from the carrier.
- **b** Pull the circuit pack out approximately 1 – 2 inches (~ 3 – 5 cm).
- **c** Re-insert the circuit pack into the carrier.
- **d** Close the latch securely.

5 Wait until all three of the top LEDs (red, green, and amber) are out.

6 At the SAT, enter **get boot-image *UUCSS*** to check the status of the firmware images on the target circuit pack.

Figure 82, Display Firmware Image(s) screen, on page 1037 appears.

Figure 82: Display Firmware Image(s) screen

```
get boot-image 1C07

                          DISPLAY FIRMWARE IMAGE(S)

              Image 1        Image 2

  Board Type: TN2501         TN2501
  FW Vintage: 02             01
HW Signature: 02             02
      Suffix: A              A
        Date: 09/13/02       05/06/02
   Timestamp: 10:30:50       12:42:18
CRC Checksum: Good           Good
Active Image: No             Yes
Reboot Image: No             Yes
```

7 Ensure that both the `Active Image` and the `Reboot Image` fields are as you expect.

Error Log Entries and Test to Clear Values

The following error log entries and tests apply to self and C-LAN-distributed downloads, not to IPSI downloads.

Table 429: FW-DWNLD Maintenance Error Log Entries

Error Type	Aux Data	Cause of Error	Alarm Level	On/Off Board	Test to Clear Value
257 (a)	See associated note	Download failure	MINOR	OFF	test firmware download *UUCSS*
258 (b)	See associated note	Download failure	MINOR	OFF	test firmware download *UUCSS*
259 (c)	See associated note	Download failure	MINOR	OFF	test firmware download *UUCSS*
513 (d)	See associated note	Download failure	MINOR	OFF	test firmware download *UUCSS*
769 (e)	See associated note	Firmware download request	MINOR	OFF	test firmware download *UUCSS*

Error Notes:

a **Error Type 257** — A log-only error indicating that a certain software resource was not available. Such an error very seldom occurs and usually produces a proc_err. However, in the firmware download feature, the file cannot be downloaded and/or the schedule can also abort/fail. To resolve the error, use **test firmware download**. The Aux Data specifies the unavailable resource that caused the error. See Table 430 for more details.

Table 430: Aux Data for Error Type 257

Aux Data	Description of Failure
1	Source board query failed **1** Check for system-wide problems. **2** Clear every error, and retry the download.
2	Target board query failed **1** Check for system-wide problems. **2** Clear every error, and retry the download.
3	Allocating resources failed **1** Check for system-wide problems. **2** Clear every error, and retry the download.
4	Firmware Download Information table query failed **1** Check for system-wide problems. **2** Clear every error, and retry the download.

Table 430: Aux Data for Error Type 257

Aux Data	Description of Failure
5	Header message failed **1** Check for system-wide problems. **2** Clear every error, and retry the download.
6	Download Map timer expired **1** Check for system-wide problems. **2** Clear every error, and retry the download.

2 of 2

b **Error Type 258** — A log-only error indicating that a source board-related error occurred. The download schedule can also abort/fail. To resolve the error, use **test firmware download**. The Aux Data specifies the error. See Table 431 for more details.

Table 431: Aux Data for Error Type 258

Aux Data	Description of Failure
1	Download image file specified on the **change firmware download** screen not present on the source board. **1** Use **list directory board *UUCSS*** to verify file system's contents.
2	The image on the source board has an invalid header. **1** Retry the test. **2** If error recurs, then escalate.
3	Bad CRC on image file on source board. **1** Retry the test. **2** If error recurs, then escalate.
4	File name too long **1** Rename the file, and try again.
5	Invalid TN code on the **change firmware download** screen does not match TN code of image on the source board. **1** Verify screen, and make sure the correct image is being used.
6	Invalid suffix on the **change firmware download** screen does not match suffix of image on the source board. **1** Verify screen, and make sure the correct image is being used.
7	Source board is not present. **1** Compare board's entered location on the **change firmware download** screen with its actual location.
8	Incorrect source board **1** Verify that the source board has a valid TN code and suffix (for example, AP).

1 of 2

Table 431: Aux Data for Error Type 258

Aux Data	Description of Failure
9	PPP ports not available **1** Use another source board, or reschedule the download for off hours.
10	DL Setup message to source failed. **1** Retry the download. **2** If error recurs, then escalate.

2 of 2

c **Error Type 259** — A log-only error indicating that the target board failed to download. To resolve the error, use **test firmware download**. The Aux Data specifies the error. See Table 432 for more details.

Table 432: Aux Data for Error Type 259

Aux Data	Description of Failure
1	Target board is not present / responding. **1** Check board's location and translations, and retry download.
2	Incorrect target board for download schedule **1** Verify board's location and download schedule.
3	Target failed to go into DL Mode. **1** Retry the download.
4	Target received bad file header **1** Get a new image, and retry download.
5	Bad checksum on source board's image **1** Get a new image, and retry download.
6	TFTP protocol error – One reason for this type of failure may be that the target board is located in a DS1-C remote PN using ami-zcs line coding to communicate with the PPN. To have a successful firmware download you must have a clear channel between the source and target board, or the source and target must reside in the remote PN. Some examples of the correct type of line coding for this feature are: b8zs and hdb3.
7	File transfer timer expired. **1** Check the board's location and translations, and retry download.
8	Target failed to reset after transfer. **1** Check the board's location and translations, and retry download.
10	Download of target failed. **1** Check the board's location and translations, and retry download.

1 of 2

Table 432: Aux Data for Error Type 259

Aux Data	Description of Failure
13	The target board rejected the download image. **1** Check the board's translations. **2** Verify the image file. **3** Retry the download, and escalate if it still fails.
20	Could not open the requested file – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
21	Problem reading the requested file – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
22	The download file has a bad CRC – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
24	A download is already in progress – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
30	A start download sequence error – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
32	The file name is too long – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
40	FLASH programming failed on firmware – Internal firmware error on target board **1** Retry the download, and escalate if it still fails.
All other Aux Data values	TFTP protocol error **1** Retry the download and escalate if it still fails.

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d **Error Type: 513** — Indicates that the schedule has failed. A schedule failure can result from:

- Any of the previously mentioned log-only errors (257 – 259)
- An expiration of the schedule timer
- An execution of **disable firmware download** command

To resolve the error and clear the alarm, use the **test firmware download** command. The Aux Data specifies the reason why the schedule failed. See Table 433, Error Type 513 Aux Data, on page 1041 for more details.

Table 433: Error Type 513 Aux Data

Aux Data	Description of Failure
1	Software resources not available; see Error Type 257 (a).
2	Source board-related failure; see Error Type 258 (b).

1 of 2

Table 433: Error Type 513 Aux Data

Aux Data	Description of Failure
3	A target board failed; see Error Type 259 (c). **1** Check image, translations and retry.
4	Two consecutive target boards failed, download schedule aborted. **1** Verify download image, translations, and retry.
5	Schedule timer expired **1** Schedule unfinished target boards, and retry.
6	**disable firmware download** command executed

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e **Error Type: 769** — Indicates that a downloadable board image is bad and that a good image needs to be downloaded. This error may be a result of a failed download attempt or a board that is in an unstable condition. The Aux Data indicates the location of the circuit pack requesting the firmware download.

Aux Data is in the form of UUAAA, where:

— UU is the port network number (cabinet)

— AAA is the angel number

For example, for Aux Data 1080, the port network number is 1 and the angel number is 80.

The angel number can be converted into the carrier and slot number by using the following table. Continuing with the example of Aux Data 1080, you look for angel number 80 in the table. You can find it in the column of carrier B and in the row of slot 15, so the target board is located in 1B15.

Table 434: Converting an angel number into carrier and slot

	Carrier				
	A	B	C	D	E
Slot #	Angel Number				
1	28	66	98	34	02
2	29	67	99	35	03
3	30	68	100	36	04
4	31	69	101	37	05
5	56	70	102	38	06
6	57	71	103	39	07
7	58	72	104	40	08
8	59	73	105	41	09
9	60	74	106	42	10
10	61	75	107	43	11
11	62	76	108	44	12
12	63	77	109	45	13

1 of 2

Table 434: Converting an angel number into carrier and slot

	Carrier				
	A	B	C	D	E
Slot #	Angel Number				
13	88	78	110	46	14
14	89	79	111	47	15
15	90	80	112	48	16
16	91	81	113	49	17
17	92	82	114	50	18
18	93	83	115	51	19
19	94	84	116	52	20
20	95	85	117	53	21
21	NA	86	118	54	22
22	NA	87	119	55	23

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System Technician-Demanded Tests: Descriptions and Error Codes

Like the FW-DWNLD (Firmware Download) MO, its associated test, *Test Firmware Download (#1413)*, is non-traditional. Maintenance software automatically executes this test as part of scheduling, verifying, and running a firmware-download schedule.

This MO provides no on-demand tests for system technicians.

Test Firmware Download (#1413)

This test is **destructive**.

This test has two functions and can only be executed if there is a download schedule to verify or there are FW-DWNLD errors to resolve and alarms to clear.

1 This test verifies that the information on the FIRMWARE DOWNLOAD screen is correct. It also verifies that the source board is of the correct type, that the file to be downloaded is present on that source board, and that the file is error free. In addition it verifies that the target board code and suffix are correct. It also retrieves the new firmware vintage for the target board and populates the appropriate field in the firmware download table.

2 If this test is executed after a FIRMWARE DOWNLOAD schedule has run, and there are FW-DWNLD alarms/errors, it resolves the errors, clears the alarms, copies the current download status table to the last table, and clears out the current table.

Table 435: TEST #1413 Firmware Download Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The firmware image file entered on the **change firmware download** screen is not present on the source board specified in the screen. **1** Execute **list directory board *UUCSS***, and verify that: ■ A file system is enabled on the board ■ The file is present **2** If the file system is not enabled: a. Execute **enable filesystem**. b. FTP the correct firmware image to the source board. If the correct image file is present, then the name entered on the screen is incorrect. **3** Execute **change firmware download**, and enter the correct file name.
2	FAIL	The image file header on the source board is invalid. **1** FTP a good firmware image file to the source board.
3	FAIL	Firmware image file on the source board has a bad CRC. **1** FTP a good firmware image file to the source board.
4	FAIL	Firmware image file name is too long. **1** Rename the image file to a file name of the correct size. **2** FTP the new image file to the source board. **3** Execute the **change firmware download** command, and enter the new file name on the screen.
5	FAIL	The TN code of the firmware image file on the source board does not match the TN code entered on the screen. The firmware file is incorrect for the board type entered on the screen. **1** Execute **list directory board *UUCSS***, and verify that a file system is enabled on the board and the file is present. **2** If the file system is not enabled, execute **enable filesystem**, and FTP the correct firmware image to the source board. **3** Execute **change firmware download**, and enter the new file name on the screen.

Table 435: TEST #1413 Firmware Download Test

Error Code	Test Result	Description / Recommendation
6	FAIL	The suffix of the firmware image file on the source board does not match the suffix entered on the screen. The firmware image file is incorrect for the board types entered on the screen. **1** Execute **list directory board *UUCSS***, and verify that a file system is enabled on the board and the file is present. **2** If the correct firmware image is not present, FTP the correct firmware image to the source board. **3** Execute **change firmware download**, and enter the new file name on the screen.
7	FAIL	The source board entered on the screen is not present. **1** Execute **display firmware download**, and verify the source board's location. **2** Verify the source board's translations. **3** If the location is incorrect, execute **change firmware download**, and enter the correct location on the screen.
8	FAIL	The source boards entered on the screen are incorrect. The board could have been changed after the schedule was entered. **1** Execute **list configuration**. Verify the source board's location. **2** Execute **change firmware download**, and enter the correct location on the screen.
	PASS	Firmware download to this circuit pack is successful.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board's translations are correct. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseat the board to reinitialize it. **3** If the board was found to be correctly inserted in step 1, then: **a** Issue the **busyout board *UUCSS*** command. **b** Issue the **reset board *UUCSS*** command. **c** Issue the **release board *UUCSS*** command. **d** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

GPTD-PT (General-Purpose Tone Detector Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
GPTD-PT	MAJOR	**test port *location* sh**	General-Purpose Tone Detector Port
GPTD-PT	MINOR	**test port *location* sh**	General-Purpose Tone Detector Port
GPTD-PT	WARNING	**release port *location***	General-Purpose Tone Detector Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

The GPTD (General-Purpose Tone Detector) ports, also known as CPTRs (Call-Progress Tone Receivers), reside on the following circuit packs:

- TN748, any suffix (mu-law companding)

S8100

The General Purpose Tone Detector (GPTD) Port, also known as Call Progress Tone Receiver (CPTR), combined tone detector and tone clock circuit pack. (The TN744 is used for additional ports.) There are two GPTD ports and four Dual Tone Multifrequency Receiver (DTMR) ports on a Tone Detector circuit pack.

The GPTD port performs level measurements of test tones and to detect call-progress tones. Examples of call-progress tones are dial tone, ring back, busy, alert, confirmation, and recall dial. The abilities of the GPTD port to perform level measurements of test tones and to detect call-progress tones are essential for maintenance of other circuit packs (for example, Tone-Clock).

The GPTD MO defines a set of tests to ensure that the GPTD port's general-purpose tone detection is functioning properly. For every Tone Detector circuit pack-level error (DETR-BD), see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

Error Log Entries and Test to Clear Values

Table 436: General-Purpose Tone Detector Port (CPTR) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1	17664	Tone Detector Audit/Update test (#43)	MAJOR MINOR (a)	ON	**test port** *UUCSSpp* **r 2**
18	0	**busyout port** *UUCSSpp*	WARNING	ON	**release port** *UUCSSpp*
130 (d)		None	WARNING	ON	**test port** *UUCSSpp* **sh r 2**

Table 436: General-Purpose Tone Detector Port (CPTR) Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
257 (b)	17666	Tone Detector Audit/Update test (#43)	MAJOR MINOR (a)	ON	**test port** *UUCSSpp* **r 3**
513 (c)	Any	Tone Detection Verification test (#42)	MAJOR MINOR (a)	ON	**test port** *UUCSSpp* **r 3**

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a A Major or a Minor alarm may be logged with this error. A Major alarm is raised when the total number of GPTD ports currently in service is less than or equal to 1/2 of the threshold number administered via the **change system-parameters maintenance** command. Otherwise, a Minor alarm is raised. In either case, run the short test sequence on the alarmed GPTD port and follow procedures for the individual test results.

b The GPTD port lost its translation. Testing the GPTD port is sufficient to reload its translation. If testing the GPTD port does not clear the error, then replace the Tone Detector circuit pack containing the defective GPTD port.

c Error Type 257 indicates the GPTD port is having problems detecting call-progress tones. If this error is logged constantly, replace the Tone Detector circuit pack containing the defective GPTD port.

d Error Type 130 indicates that the circuit pack has been removed or has been insane for at least 11 minutes. To clear the error, reinsert or replace the circuit pack.

Technician-Demand Tests: Descriptions and Error Codes

Always investigate tests in the following order when inspecting errors in the system. For example, by clearing error codes associated with the *Tone Detection Verification* test (#42), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Tone Detection Verification test (#42)	X	X	ND
Tone Detector Audit/Update test (#43)	X	X	ND

1 D = Destructive; ND = Nondestructive

Tone Detection Verification Test (#42)

This test verifies that the call-progress tone-detection and the tone-level measurement capabilities of the GPTD port are functioning properly.

Table 437: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
	ABORT	The system was not able to allocate every resource needed for this test, or there was an Internal system error.
1	ABORT	The system could not allocate every resource needed to test the call-progress tones.
1001	ABORT	The system was unable to put the GPTD port in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. If the system is not heavily loaded, then test the TDM-BUS via **test tdm 1** or **2**. **1** Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a Tone-Clock for the test connection. This may be caused by a heavy load on the system or by a faulted Tone-Clock. **1** Check to see if there are any alarms against the Tone-Clock in the port network where the test aborted. If so see the recommended procedures for TONE-BD (Tone-Clock Circuit) on page 1902 or TONE-PT (Tone Generator) on page 1927. **2** If a new Tone-Clock has been inserted, allow about 1 minute for maintenance to run on the newly inserted circuit pack. **3** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2006	ABORT	The active Tone-Clock circuit pack or a Tone Detector circuit pack may not be functioning properly. **1** Test the *active* Tone-Clock circuit pack in the port network with the **test tone-clock *UUC*** command, and see TONE-BD (Tone-Clock Circuit) on page 1902 for failures. **2** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals up to 5 times.
101–122	FAIL	**1** Run the short test sequence: **test port *UUCSSpp* sh r 1**. **2** If the problem persists, the system is still operating properly but system capacity will be reduced. In order to restore the system performance to normal, replace the tone detector circuit pack containing the defective GPTD port.
1022	FAIL	Tone detection for the system is administered as part of a wideband configuration, and the tone detector is not a TN420C (the only circuit pack with this capability). GPTD ports on other types of tone detector circuit packs are taken out of service since they cannot provide the administered function. **1** Change the tone-detection mode administered on the system-parameters country-options screen, or remove every circuit pack except TN420C tone detectors from the system.

Table 437: Test #42 Tone Detection Verification Test

Error Code	Test Result	Description / Recommendation
	PASS	Tone Detection Verification is successful. The GPTD port is able to detect every call-progress tone and perform level measurements of test tones.

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Tone Detector Audit/Update Test (#43)

The GPTD port is refreshed with all time-slot information, and a sanity audit is performed on the GPTD port.

Table 438: Test #43 Tone Detector Audit/Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	The system was not able to allocate the resources needed for this test. **1** Wait 1 minute and try again.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Hardware audit failed. **1** Run the short test sequence: **test port *UUCSSpp* short repeat 1**. **2** If the problem persists, the system is still operating properly but system capacity will be reduced. To restore the system performance to normal, replace the Tone Detector circuit pack containing the defective GPTD port.
	PASS	The GPTD port has been successfully refreshed with its translation.

H323-BCH (H.323 B Channel)

S8700 / S8500 / S8100

No maintenance diagnostic tests exist for this object.

H.323 signaling is very similar to ISDN Q.931 signaling. In order to take advantage of existing ISDN Avaya™ Communication Manager, H.323 trunk ACommunication Manager software includes H.323 signaling groups, H.323 D channels and H.323 B channels. H.323 signaling groups are similar in concept to ISDN PRI signaling groups. H.323 D-channels are an artificial fabrication created only to allow maximum re-use of system ISDN code. H.323 B channels are also an artificial fabrication.

No physical hardware components make up the H.323 B-channel object discussed here. Along with the D channel, these objects allow existing ISDN Communication Manager software to be re-used for H.323 trunking. The H.323 signaling group is not a collection of physical D-channels that exist on one or more DS1 facilities. The H.323 signaling group can be considered to be one D channel that physically rides on a C-LAN port and the IP network. Unlike ISDN D-channels, the H.323 D channel may actually come up and down on a call-by-call basis. So the H.323 D channel is actually a TCP/IP signaling channel. Layer 1 and 2 of this signaling channel can be monitored by IP PING testing.

Performance in terms of voice latency for a signaling group is monitored by background measurements being collected by the TN802B Media Processor board.

H.323 B channels actually use TN802B Media Processor ports to carry the actual bearer. The TN802B is a service circuit. On a call-by-call basis, any port of a TN802B may be serving an H.323 station or an H.323 B channel. Status information may exist for a specific H.323 B channel, and an H.323 B channel may be busied out and released, but no maintenance diagnostic tests will exist for the object.

Errors are logged for *craft* busyout conditions. The system receives service state updates for *craft*-driven busyout/release. Under normal conditions the system automatically places H.323 B channels into or out of service when it receives an H.323 signaling-group service state update. *Craft* busyout drops active calls.

Error Log Entries and Test to Clear Values

Table 439: H323-BCH B-Channel Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Service State
18 (a)	Any	B-channel busied out	Warning	off	*OOS*

Note:

a **Error Type 18**: Indicates that this specific H323 trunk group member has been *craft* busied-out.

System Technician Commands

The following commands are available to the system technician:

- **busyout port *UUCSSpp*** – This command on a specific H.323 B channel drops any active call that may exist on that B channel and effectively reduces the trunk group's capacity by one. No physical piece of hardware is removed from service.
- **release port *UUCSSpp*** – This command on a specific H.323 B channel effectively increases the trunk group's capacity by one. No physical piece of hardware is actually added to service.
- **status trunk *grp*/*mbr*** – This command is used to find the current status of the specific B channel. Additional status for an H.323 B channel shows near- and far-end IP signaling addresses, near- and far-end H.245 addresses, tunneling status, call-reference value for an active call, and the H.323 conference ID.
- **test port *UUCSSpp*** – This command results in the message `No tests applicable to this object.`

H323-SGRP (H.323 Signaling Group)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
H323-SGRP	MINOR	**test signaling-group *grp#***	H323 Signaling Group
H323-SGRP	WARNING	**test signaling-group *grp#***	H323 Signaling Group

1 ***grp#*** is the signaling group number (1–166); the test sequence can be either short or long.

The H.323 Signaling Group (H323-SGRP) MO supports a signaling channel (D channel) for H.323 Trunk connections. The MedPro TN802 circuit pack provides audio connectivity, working in concert with a C-LAN (TN799DP) circuit pack that provides control signaling to support an H.323 connection.

The H.323 signaling group (H323-SGRP) is a Signaling channel that physically resides on a C-LAN port (socket) and the IP network. Unlike ISDN D-channels, the H.323 channel may actually come up and down on a call by call basis. The H.323 channel is actually a TCP/IP signaling channel. Layers 1 and 2 of this signaling channel are monitored by IP PING testing.

S8100: Monitor Layers 1 and 2 of the H.323 signaling channel using IP PING from the LAC or from the **ping** SAT command.

Error Log Entries and Test to Clear Values

Table 440: H323-SGRP Signaling Group Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any		**test signaling-group** *grp#*
1 (a)	Any	Ethernet Port Status test (#1386)	MINOR	OFF	**test signaling-group *grp#***
257 (b)	Any	H.323 SGRP PING test (#1387)	MINOR	OFF	**test signaling-group *grp#***
513 (c)	Any	H.323 SGRP PING test (#1387)	WARNING	OFF	**test signaling-group *grp#***
S8100: 769 (d)	Any		WARNING	OFF	
770 (e)	Any		WARNING	OFF	
1025 (f)	Any	MEDPRO Status test (#1392)	MINOR	OFF	**test signaling-group *grp#***
1281 (f)	Any	MEDPRO Status test (#1392)	MINOR	OFF	
S8100: 1537 (g)	Any		NONE		

Table 440: H323-SGRP Signaling Group Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1794 (h)		MEDPRO Status test (#1392)	MINOR	OFF	**test signaling-group *grp#***
2049 (i)		Keep Alive Failure	MINOR	OFF	**test signaling-group *grp#***
2305 (j)		Gateway Unregistered	MINOR	OFF	**test signaling-group *grp#***

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a **Error Type 1** — Represents a failure of the C-LAN hardware carrying the signaling group D channel.

S8100: To determine which C-LAN had been administered for this signaling group, find the near-end node name on the **signaling group** form; then find the C-LAN with the same node name on the **ip-interfaces form**.

Check for errors against the CLAN-BD MO.

b **Error Type 257** — Tracks failures of the H.323 signaling-group PING test. H.323 signaling-group PING test failures are documented later in this MO.

c **Error Type 513** — Tracks excessive round-trip delay of the H.323 signaling-group PING test, if the round-trip delay exceeds 4 seconds.

d Error Type: 769 — **S8100**: Indicates that test packets sent from a media processor circuit pack to the far-end ip address specified on the signaling-group form have exceeded the IP latency and loss thresholds, as administered on the system-parameters maintenance form. Exceeding these thresholds indicates that the IP network may not be providing sufficient quality service for adequate transmission of voice. If the signaling group has been administered to enable BYPASS, then error type 1025 also occurs.

e **Error Type: 770** — Tracks excessive latency and packet-loss from background IP measurements collected by the Media Processor Board.

f **Error Type 1025** — Indicates that the signaling group has been placed into a BYPASS condition because of IP network congestion. The signaling group accepts incoming calls, but every outgoing call is denied. The system routes these calls over a secondary route, if one has been administered.

g **Error Type 1281** — Implies that no medpro resources are in service to provide media connections for the trunk members of the signaling group.

S8100: Check for errors against the MEDPRO and MEDPROPT maintenance objects. This error causes all H323 B Channels to be in an out-of-service near-end state.

h **Error Type 1537** — **S8100**: Indicates that the far end of the signaling group is not ready to handle audio bearer. If the other end of this signaling group is also a Communication Manager server, this error means the server on the other end does not have MEDPRO in-service for its signaling group.

i In the absence of error 1281, this error places the H323 B Channels into an out-of-service far-end state.

j **Error Type 1794** — The Sig Group reported that the far end has detected excessive packet latency or loss.

k **Error Type 2049** — A Keep-Alive timer is set for every registered endpoint on the Remote Office, and the switch expects Keep-Alive update within that timer's time period. If the update does not occur, a message is generated that causes an error to be logged against MO REM-OFF, as well as MO H323-SGRP. Because the signaling group is still known, the error against MO H323-SGRP generates a Minor alarm. This error is only valid if the **change signaling-group** screen has the RRQ field set to **y**. This error counter is only set if a failure has been detected by Communication Manager and it notifies maintenance software. The Keep-Alive Error Type 2049 clears only after a registration occurs and Error Type 2305 clears.

l **Error Type 2305** — Indicates that the Gateway (signaling group on the Remote Office) is unregistered. Because the signaling group is still known, the error against MO H323-SGRP generates a Minor alarm when this failure occurs. This error is only applicable if the **change signaling-group** screen has the RRQ field set to **y**.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *CLAN Ethernet Status* test (#1386), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
CLAN Ethernet Status test (#1386)	X	X	ND
MedPro Status test (#1392)	X	X	ND
H.323 Signaling Group Ping test (#1387)	X	X	ND

1 D = Destructive; ND = Nondestructive

CLAN Ethernet Status Test (#1386)

This test is **non**destructive.

This test checks the status of the C-LAN Ethernet port that originated this signaling group. If the C-LAN Ethernet port is in service, the test passes; if it is OOS (out of service), the test fails.

NOTE:
Failure of this test will put the SIG-GRP in the OOS state.

Table 441: Test #1386 CLAN Ethernet Status Test

Error Code	Test Result	Description / Recommendation
1125	ABORT	Ethernet Link is not in service. **1** Check if the Ethernet link is in service or not. If the link is not in service, release the link using **release link *n*** or **release port *UUCSSpp***, and repeat the test. This is a normal abort. **2** If the test continues to abort after following the repair procedures, escalate the problem.
2000	ABORT	Response to the test was not received from the TN799DP C-LAN circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack if the other ports on the board are idle (amber LED is off). Reset the circuit pack by issuing **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** If this result occurs again, replace the circuit pack.
2100	ABORT	The necessary system resources to execute the test could not be allocated. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	The C-LAN Ethernet port corresponding to the near-end address of the SIG-GRP that is OOS has failed. Every session is down. **1** Execute **test port *UUCSSpp* long** and verify the result of the H.323 Signaling Group Ping test (#1387). If the test continues to fail, escalate the problem. If the test passes wait for the sessions to come up.
	PASS	The C-LAN Ethernet port corresponding to the near-end address of the SIG-GRP that is in service has passed this test. Every session on the Ethernet link is up.

H.323 Signaling Group Ping Test (#1387)

This test is nondestructive.

This test is only run for those signaling groups that have an administered far-end IP address. If the H.323 signaling group does not have an administered far-end IP address, the test will abort.

The test determines the local C-LAN through which the signaling originates, and the far-end terminating IP address. It then requests the local C-LAN to execute a PING on the far-end address. If the PING is successful, the test passes; if the ping is not successful, the test fails.

NOTE:
Multiple failures of this test can take the H.323 signaling group out of service.

If the PING is successful, this test looks at the PING round-trip delay. If a round-trip delay of greater than 4 seconds is reported, a separate error is logged. Excessive round-trip delays within the signaling group will not take the signaling group out of service, however.

Services can execute the standard PING command using the C-LAN board's address and far-end IP address from the signaling group screen to see the actual round-trip delay.

This test checks the circuitry involved in the data path of a peer-to-peer IP layer connection.

This test is a nondestructive test. It runs because of in-line errors, during periodic and scheduled maintenance, and on-demand.

Table 442: Test #1387 H.323 Signaling Group Ping Test

Error Code	Test Result	Description / Recommendation
1, 2	ABORT	Internal Error. **1** Retry the command at 1-minute intervals up to 3 times.
7	ABORT	Destination unreachable. **1** Verify that the C-LAN has been administered with an IP-Route that enables the C-LAN to reach the far-end IP address. **2** Once verified, execute **test sig-group *grp#*** to verify that the H.323 Signaling Group Ping test (#1387) passes.
1005	ABORT	Configuration for this test is incorrect. **1** Verity that the link is in service with the **status port** or **status link**. Verify that the routing table has destinations that are reachable through this port. **2** Repeat the test. **3** If the test aborts with Error Code 7, while step 1 verified, escalate the problem.
1125	ABORT	Link is not in service. **1** Check if the link is in service or not. If the link is not in service, release the link using **release link** or **release port**, and repeat the test. This is a normal abort. **2** If the test continues to abort after following the repair procedures, escalate the problem.
2000	ABORT	Response to the test was not received from the C-LAN circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack if the other ports on the board are idle (amber LED is off). Reset the circuit pack by issuing the **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 442: Test #1387 H.323 Signaling Group Ping Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	The necessary system resources to execute the test could not be allocated. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3times.
2800	ABORT	No C-LAN in the same region. **1** Verify translations and retest.
2801	ABORT	No IP address defined. **1** Verify translations and retest.
2802	ABORT	Different IP address pinged than software had allocated for the test. **1** Retry the command at 1-minute intervals up to 3 times.
7, 89, 1007	FAIL	PING to the destination failed through this port because the destination was down. **1** Verify that at least one destination reachable through this port is “up”. Once verified, execute **test signaling-group *grp#*** to verify that the H.323 Signaling Group Ping test (#1387) passes.
S8100: ANY	ABORT	Refer to the CLAN Port PING test in TCP/IP Ping Test (#1281) on page 1519 for a more detailed description of the reasons for the abort.
S8100: ANY	FAIL	The far-end of the signaling group could not be reached. **1** Refer to the C-LAN port PING test in TCP/IP Ping Test (#1281) on page 1519 for a more detailed description of the reasons for the failure.
	PASS	PING through this port was successful.

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MedPro Status Test (#1392)

This test is **non**destructive.

This test determines if at least one media processor port exists that is in service, and that serves the same region as the C-LAN that the signaling group uses. If at least one exists and is in service, the test passes; otherwise, the test fails.

Table 443: Test #1392 MedPro Status Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	The necessary system resources to execute the test could not be allocated. **1** Retry the command at 1-minute intervals up to 5 times.
2500 **S8100**: Any	ABORT	Internal system Error. **1** Retry the command at 1-minute intervals up to 3 times

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Table 443: Test #1392 MedPro Status Test

Error Code	Test Result	Description / Recommendation
	FAIL	No MEDPRO ports in this region are in service. Every session is down. **1** **S8100**: Check the system for errors against MEDPRO and MEDPROPT maintenance objects. **2** Execute **test signaling-group *grp#*** and verify the result of the H.323 Signaling Group Ping test (#1387). If the test continues to fail, escalate the problem. If the test passes, wait for the sessions to come up.
	PASS	Every session on the Ethernet link is up.

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H323-STN (H.323 IP Station)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
H323-STN	WARNING	**test station *extension***	H.323 IP Station

H323-STN covers implementation of the maintenance for native mode H.323 endpoints. Native mode H.323 applications such as Netmeeting or Proshare provide only what is needed to support the H.323 standard. Communication Manager can invoke very little in the maintenance area. Communication Manager reports errors as they are detected via the RAS registration and keep-alive mechanism. Communication Manager PINGs the endpoint via the signaling path, for example via C-LAN, and via the media path, for example, via Medpro.

The H.323 station type is not attached to a port board. Insertion of the station is not driven by board insertion, it is driven by successful registration of the endpoint. The H.323 station is maintained via a set of explicit TCP/IP ping requests and errors reported by the switch software, which terminates the H.323 signaling portion of each endpoint. H323-STN follows standard maintenance methodology and supports test, busyout, release and status commands.

Error Log Entries and Test to Clear Values

Table 444: H323-STN IP Station Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any		**test station *extension***
1 (a)		Registration Status Inquiry test (#1372)	WARNING	OFF	
257 (b)		Signaling Path PING test (#1373)	WARNING	OFF	
513 (c)		Media Path PING test (#1374)	WARNING	OFF	

Notes:

a **Error Type 1** reports the registration status of the endpoint. If Communication Manager claims the endpoint is registered and receives keep-alive handshakes from the endpoint, the test passes. If keep-alive handshaking fails, the test fails. If the user has intentionally un-registered the station from the Media Server, the station is basically an AWOH station and is no longer being maintained; no tests will run for this station.

b **Error Type 257** tracks failures of the signaling path PING test. The test attempts to send a PING packet to the endpoint IP address, as reported during registration. The PING packet originates with the C-LAN board through which the endpoint is registered. If the PING response packet is received, the test passes. If the PING response packet times out, the test fails.

c **Error Type 513** tracks failures with the media path PING test. The test attempts to send a PING packet to the endpoint IP address, as reported during registration. The PING packet originates with a Media Processor board. Any Media Processor board may be used as long as it is administered to be in the same network region as the C-LAN board through which the endpoint is registered. If the PING response is received, the test passes. If the PING response packet times out, the test fails.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order below. By clearing error codes associated with the *Signaling Path PING* test (#1373), for example, you may clear errors generated from other tests in the sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Registration Status Inquiry test (#1372)	X	X	ND
Signaling Path PING test (#1373) **S8300** / **G700**: This test aborts on a G700 Media Gateway with Error Code 1412.	X	X	ND
Media Path PING test (#1374)	X	X	ND

1 D = Destructive; ND = Nondestructive

Registration Status Inquiry Test (#1372)

The Registration status inquiry reports the H.323 registration status of the endpoint. An endpoint must be registered and authenticated in order to receive service from the system.

Registration is initiated when the endpoint user attempts to login using the Avaya registration software application running on the endpoint PC. The user must provide a valid extension and security code. The registration messages are sent to the IP address of a C-LAN Ethernet port.

A registered extension has a port type SNNNNN, where N is a digit from 0–9. A non-registered extension has an X port.

Table 445: Test #1372 Registration Status Inquiry

Error Code	Test Result	Description / Recommendation
1, 2, 3	FAIL	The endpoint is not successfully registered. **1** Verify that the user is entering the: • correct extension and security code • C-LAN IP address **2** Verify that the extension has been enabled for IP softphone operation. **3** If many endpoints cannot register, investigate any errors of the C-LAN Ethernet port. **4** Examine the Ethernet cabling from the endpoint PC to the Ethernet hub.
	PASS	The endpoint is successfully registered and continues to respond to registration handshaking.

Signaling Path PING Test (#1373)

This test is nondestructive.

Signaling Path PING test determines the local C-LAN through which the signaling originates and the endpoint's IP address. It then requests the local C-LAN to execute a PING on the endpoint's address. If the PING is successful, the test passes, if the PING is not successful, the test fails.

NOTE:
Multiple failures of this test can take the H.323 IP Station out of service.

NOTE:
S8300 / **G700**: This test does not execute on a G700 Media Gateway.

This test checks the circuitry involved in the data path of a peer-to-peer IP layer connection.

This nondestructive test runs due to in-line errors, during periodic and schedule maintenance, and on demand.

Table 446: Test #1373 Signaling Path PING Test

Error Code	Test Result	Description / Recommendation
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** Escalate if the problem persists.

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Table 446: Test #1373 Signaling Path PING Test

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
1003	FAIL	Ping to the destination failed. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Investigate any C-LAN Ethernet port errors.
1007	FAIL	The system could not PING the registered endpoint via the C-LAN. **1** Verify that at least one destination reachable through this port. PING this destination (**ping ip-address *xxx.xxx.xxx.xxx***). **2** If the PING to any destination is successful through this port, the link is up. **3** If PING to every destination fails, test the C-LAN port (**test port *UUCSSpp* short**), and follow repair procedures for Session Status test (#1286) failures. **4** If only this station cannot be pinged: • Make sure the PC is up. • Make sure the PC has a network connection (Ethernet or dial-up). • Check the Ethernet cabling.
	PASS	The system can successfully send IP packets to the registered endpoint from the C-LAN.

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Media Path PING Test (#1374)

This test is nondestructive.

The test selects a Media Processor board. It then requests the local Media Processor to execute a PING on the endpoint address. If the PING is successful, the test passes, if the PING is not successful, the test fails.

Services can execute the standard **ping** command using the Media Processor board address and endpoint IP address to see the actual round-trip delay.

This test checks the IP network connectivity needed for audio packets to be sent to the endpoint.

This nondestructive test runs due to in-line errors, during periodic and schedule maintenance, and on demand.

Table 447: Test #1374 Media Path PING Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
2806	ABORT	No Media Processor board found to use for this test.
ANY	FAIL	The system could not PING the registered endpoint from a Media Processor board. This may result in calls with no talk path. **1** If the Registration Status Inquiry test (#1372) fails, follow those procedures. **2** Refer to MEDPRO, Test #1378, for a detailed description of the error codes.
	PASS	PING through this Media Processor is successful.

HYB-BD (Hybrid Line Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
HYB-BD	MINOR	**test board *location* sh**	Hybrid Line circuit pack
HYB-BD	WARNING	**test board *location* sh**	Hybrid Line circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also HYB-LINE (Hybrid Line) on page 1065 for related line information.

HYB-LINE (Hybrid Line)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
HYB-LINE	MINOR	**test port *location* l**	Hybrid Line
HYB-LINE	WARNING	**test port *location* l**	Hybrid Line

1 For information on specifying a ***location***, see Command Syntax on page 179.

Hybrid Line is another term for the MFAT (Multi-Function Analog Telephone). The Hybrid Line set is also known as an SCS (Small Communications System).

The TN762B Hybrid Line circuit pack supports eight of these multifunction analog telephone sets. The Hybrid Line sets use three pairs of wires: an analog voice pair, a transmit/receive pair, and a power pair.

This section describes HYB-LINE (Hybrid Line) maintenance. HYB-LINE maintenance is closely related to, and sometimes interacts with, HYB-BD (Hybrid Line circuit pack) maintenance. This interaction should be kept in mind when troubleshooting Hybrid Line problems.

This section occasionally refers to a station's service state. These service states are defined as follows:

Out-of-Service	The port, and thus the station, have been removed from service. A busyout of a port will cause it to be out of service.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally, but it can also be forced into the in-service state if it goes off-hook.

Use **status station** to determine terminal service state. Status is reported as either out of service, in service, or disconnect. The latter is equivalent to the ready-for-service state.

Error Log Entries and Test to Clear Values

Table 448: Hybrid Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1(a)	40987	None	WARNING	OFF	

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Table 448: Hybrid Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
15(j)	Any	Hybrid Line Audits test (#161)			
18(b)	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
130(c)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257(d)	40988	None	MINOR WARNING	OFF	
513(e)	40965	Hybrid Line Audits test (#61)	WARNING	OFF	**test port** *UUCSSpp* **sh r 4**
769(f)		Remote Dig Looparound test (#59)	WARNING	OFF	**test port** *UUCSSpp* **sh r 3**
1025		Hybrid & Conf. Circuits test (#57)	MINOR WARNING	ON	**test port** *UUCSSpp* **l r 3**
1281(f) **S8100**: (g)		Local Digital Looparound test (#58)	WARNING	ON	**test port** *UUCSSpp* **l r 3**
1537(g) **S8100**: (h)	40968	None	WARNING	OFF	
1793		TDM NPE Crosstalk test (#6)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **l r 3**
2049(h) **S8100**: (i)	32770	None			
2049(i)	40967	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major or minor alarms may be downgraded to Warning alarms based on the value used in the set options command.

Error Notes:

a The data link between the port and the terminal is not operational. (An off-board problem was detected by port circuit). Verify that the Hybrid set is connected and that the Electronic Power Feed (EPF) test passes. If data transmission problems are experienced, check for defective wiring or a defective voice terminal, or move terminal closer to the switch (reduce the length of the wiring between the terminal and the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired after a predetermined delay.

b Error type 18 indicates the port is busied out. The port is released with **release port *UUCSSpp***.

c The circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d The EPF has been turned off due to an overcurrent condition at the voice terminal. Check for defective wiring or a damaged jack, and make sure the voice terminal is a Hybrid set. Once the problem has been resolved, the alarm will be retired after a predetermined delay.

e The voice terminal has been disconnected or there is a problem in the wiring to the terminal. Make sure that the voice terminal is connected or check for defective wiring to the voice terminal.

f Note that Error Types 769 and 1281 by themselves create Warning alarms only, but if both are present, a Minor alarm will be logged.

g The port has reported a problem with the data link to the voice terminal. Ignore this error if there are no complaints about the voice terminal. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and decrease the length of the wiring between the voice terminal and the switch. If the problem persists, replace the circuit pack.

h The voice terminal went off-hook while in the disconnect state. Use the **status station** command to determine the state of the terminal. The off-hook should have moved the terminal to in service. No repair action is necessary.

i The link between the circuit pack and the voice terminal has been successfully reset. No repair action is necessary.

j Error 15 indicates a software audit error that does not indicate any hardware malfunction. Run the short test sequence and investigate any errors.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the Local Digital Looparound test (#58), you may also clear errors generated from other tests in the testing sequence.

Table 449: System Technician-Demanded Tests: DS1-BD

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6)		X	ND
Hybrid Electronic Power Feed test (#56)		X	ND
Hybrid Circuit and Conference Circuit test (#57)		X	ND
Local Digital Looparound test (#58)		X	ND
Remote Digital Looparound test (#59)	X	X	ND
Station Lamp Update test (#60)	X	X	ND
Station Audits test (#61)	X	X	ND
Ringer Update test (#62)	X	X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of a port's long test sequence and takes about 20 to 30 seconds to complete.

Table 450: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. This could be a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.

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Table 450: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	Test disabled by administration. This only applies to analog stations. The default for this field is 'y,' so you may want to determine why it has been turned off for this station. **1** To enable test, set the Test field on the station administration screen for the particular analog station being tested to **y**. Use **change station *extension***.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-PN, EXP-INTF, RMC-ENV faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear every off-board problem before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. **1** Resolve any "EXP-PN, RMC-ENV," or "EXP-INTF" errors in the error log. **2** Resolve any "TDM-BUS" errors in the error log. **3** Retest the board when the faults from steps 1 and 2 are cleared.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Hybrid Electronic Power Feed Test (#56)

In this test, the software requests that the EPF be turned on for a given port. Then hardware attempts to turn on the power unit from the station. If no current is drawn, the station is probably not connected. If an overturned condition is sensed (that is, too much current is being drawn), this may indicate a short in the loop or a defective voice terminal. A message is returned stating that either the EPF was turned on successfully, or that an overcurrent condition exists. This test is repeated once more 5 seconds later. If either test is not successful, the test will abort (see first ABORT entry in Table 451, Test #56 Hybrid Electronic Power Feed Test, on page 1070).

Table 451: Test #56 Hybrid Electronic Power Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use the **display port *UUCSSpp*** command to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Electronic Power Feed test passed. The message to turn on the power to the station was successfully sent to the port. **1** Although this test never actually returns a FAIL result, except for the previous **Internal system error**, it logs an error if the overcurrent case is detected by the hardware. Check the Error Log for any entries with Error Type 257 when the test has completed. **2** If Error Type 257 does not appear in the Error Log within 10 seconds after completion of this test, it is safe to assume that the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station, if available, and check that every feature button is operating. **3** If Error Type 257 appears in the Error Log, this indicates some problem with the power to the station. Check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.

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Table 451: Test #56 Hybrid Electronic Power Feed Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Hybrid Circuit and Conference Circuit Test (#57)

This test checks two different port circuit functions. The Hybrid Circuit test performs an analog reflective looparound measurement on the port's hybrid circuitry. The conference circuit test performs a conference test on the port's NPE.

For the Hybrid Circuit Test results to be valid, a voice terminal must be connected to the port being tested. The test instructs the on-board microprocessor to put the port in analog reflective looparound mode.

The Conference Test is performed only if the Hybrid Test passes. The Conference Circuit Test verifies that the Network Processing Element (NPE) is able to correctly conference several test tones together.

Table 452: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.

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Table 452: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	Could not allocate the necessary system resources to run this test. This could be a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either **display port** (the display shows that the port is a TTI port) or **list config** (the display shows a `t` for the port). **2** If **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	The system could not allocate a tone generator for the test. **1** Resolve any TONE-PT errors. **2** If no TONE-PT errors appear in the Error Log, retry the test at 1-minute intervals up to 5 times.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 452: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
7	FAIL	Conference test failed. User may be able to use conference circuit without difficulty in some cases. In other extreme cases, conference calling will be totally restricted. The failure may be due to off-board circumstances, the most common of which is an off-hook occurring during the test. Also, check the error logs against the GPTD-BD, the TONE-BD, and the TONE-PT. **1** This error can be caused by a disconnected terminal. First, ensure that the terminal is connected and the wiring is OK. **2** Then, issue **display port** and **status station** to determine whether the station is idle. If so, issue **test port** for this port. **3** If test continues to fail, issue **busyout port** and **release port**, and then retest the port. **4** It is possible that the port may still be functional from a user's point of view.
57	FAIL	Hybrid Circuit test failed. This could result in noisy or bad connections. **1** This error can be caused by a disconnected terminal. First, ensure that the terminal is connected and the wiring is OK. **2** Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using **test board *UUCSS* short**. **3** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. **4** If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Hybrid Line circuit pack. If the Hybrid Circuit and Conference Circuit test fails for every port on a circuit pack, a -5 volt power problem is indicated. The AC power unit may be defective. The system may contain a TN752 power unit circuit pack **or** a 631DB AC power unit, *but not both types of power units.* To investigate problems with a power unit, see RMC-ENV MO. or CARR-POW (Carrier Power Supply) on page 578.
	PASS	Hybrid Circuit and Conference Circuit test passed. The hybrid circuitry is transmitting properly. **1** If complaints still exist, investigate by using other port tests, and by examining the station, wiring, and connections.

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Table 452: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board inserted, an incorrect board inserted, or an insane board inserted. **1** Check that the board translations are correct. Use **list config**, and resolve any problems. **2** If the board was found to be correctly inserted in step 1, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check that there is a valid board inserted.

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Hybrid Line Local Digital Loop-Around Test (#58)

This test checks the control channel between the media server and the port's digital circuitry. The media server sends transparent data to the on-board microprocessor and compares the data echoed back. This test is repeated three times.

Table 453: Test #58 Hybrid Line Local Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use the **display port *UUCSSpp*** command to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 453: Test #58 Hybrid Line Local Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
1, 2, 3	FAIL	The control channel between the processor and the port is not transmitting properly. This port is not operable. **1** Retry the test. **2** If the failure still occurs, issue **busyout** and **release busy**, and then retest. **3** If the failure is occurring on more than one port on the board, suspect the board. **4** If the failure is occurring on several boards in the same carrier, escalate the problem. **5** If the failure appears to be isolated to one port, check all wiring to the set and all set connections. **6** Replace the circuit pack as a last resort.
	PASS	Hybrid Line Local Digital Looparound test passed. The control channel is transmitting properly. **1** If complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Hybrid Line Remote Digital Looparound Test (#59)

This test checks the digital control pair from the port circuit to the terminal. The on-board microprocessor sends a message to the terminal and checks for a proper return message. This test is repeated three times, with two out of the three attempts passing being sufficient for this test to pass. This test will run if the station is in service or out of service.

Table 454: Test #59 Hybrid Line Remote Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1	ABORT	A request for a remote station audit aborted even though every internal resource was correctly allocated. **1** Look in the error log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port via **release port *UUCSSpp*** command or **release station *extension***, and then run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2, 3	FAIL	No response was received within the allowable time period on one of the transmissions to the terminal. This indicates a problem with the data link to the voice terminal. This could be a sleeping set problem or it may be due to wiring or an unplugged or defective set. **1** Check for errors in the error log, for example, error 1537. **2** Remotely issue **busyout** and **release busy**, and run the short test sequence on the port to check for other errors associated with the port or terminal. **3** Check the wiring to the set if it appears that the terminal is not responding to any tests; otherwise, replace the terminal and rerun the test. **4** If the test still fails, replace the circuit pack and reconnect the original terminal.
	PASS	Hybrid Line Remote Digital Looparound test passed. The hybrid circuit pack is sending and receiving proper messages to and from the voice terminal. **1** If problems still exist, investigate using other circuit pack tests and by examining the station, wiring, and connections.

1 of 2

Table 454: Test #59 Hybrid Line Remote Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Hybrid Line Lamp Updates Test (#60)

For this test, the software lights the lamps on the terminal based on the status record contained in the processor. The lamp updates will run only if the station is in service.

Table 455: Test #60 Hybrid Line Lamp Updates Test

Error Code	Test Result	Description / Recommendation
1	ABORT	A request for a remote station lamp update aborted even though every internal resource was correctly allocated. **1** Look in the error log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port via **release port *UUCSSpp*** or **release station *extension***, and then run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
2	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	The station is in a ready for service or an out of service state. This may be due to wiring or an unplugged or defective set. **1** Make sure terminal is connected and the wiring is correct. **2** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 455: Test #60 Hybrid Line Lamp Updates Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either **display port** (the display shows that the port is a TTI port) or **list config** (the display shows a `t` for the port). **2** If **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Hybrid Line Lamp Updates completed successfully **1** If complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Hybrid Line Audits Test (#61)

This is a series of three tests that are classified as audits. These audits will abort if attempted on an out-of-service station. The tests are as follows:

- Switchhook Audit — This updates the media server's records according to the circuit packs' records.
- Bad Scan Inquiry — An up-link message is sent containing a count generated due to certain events relating to the data link's conditions. This indicates data-transmission problems between the Hybrid circuit pack and the voice terminal.

- EPF Inquiry — An up-link status message of the Electronic Power Feed is sent. Possible conditions are: EPF-on-ok, EPF-off, EPF-no-load, and EPF-on-overcurrent.

Table 456: Test #61 Hybrid Line Audits Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
1	ABORT	The test was aborted due to an internal system error during the switchhook audit.
2	ABORT	Internal system error occurred during bad scan inquiry audit. **1** Make sure that the station is not in an out of service state. **2** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	This port may have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port via **release station *extension***, and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use the **display port *UUCSSpp*** command to determine the station extension number of the port. Use the **status station** command to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either the **display port** command (the display shows that the port is a TTI port) or the **list config** command (the display shows a `t` for the port). **2** If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 456: Test #61 Hybrid Line Audits Test

Error Code	Test Result	Description / Recommendation
	PASS	Hybrid Line Audits test passed. **1** Although this test never actually returns a FAIL result (except for the previous **Internal system error**), it can enter Error Types 257 and 513 into the Error Log. To check for problems that don't show up in the test result, look for these error types in the Error Log. **2** If these errors appear in the Error Log, or if user complaints still exist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Hybrid Line Ringer Update Test (#62)

In this update, a ''ringer on'' or a ''ringer off'' message is sent to the firmware to start and stop the ringer on the set.

Table 457: Test #62 Hybrid Line Ringer Update Test

Error Code	Test Result	Description / Recommendation
3	ABORT	This port may have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this Error Type is present, release the port via **release station *extension***, and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.

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Table 457: Test #62 Hybrid Line Ringer Update Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension number of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until it is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using either **display port**, where the display shows that the port is a TTI port, or **list config**, which shows a `t` for the port. **2** If either **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Hybrid Station Ringer Update passed **1** If complaints still exist, investigate using other circuit pack tests on this circuit pack, and by examining the terminal, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release busy board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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INADS (INADS Link)

S8700 / **S8500** / **S8300** / **S8100**

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
INADS	none	**test inads-link**	INADS Link

The INADS Link MO represents the software and communications link used by the switch to call an alarm receiver. The purpose of the INADS Link MO is to:

- Check the communications link between the system and the alarm receiver
- Verify that the alarm notification process works correctly

To verify that alarms will be reported to the alarm receiver, either a centralized technician can remotely test the process, or an on-site technician can test the connection either during an installation or a subsequent service call.

Although the INADS Link MO never alarms, its errors are logged, and these errors are **only** logged by issuing the **test inads-link** command.

Error Log Entries and Test to Clear Values

The Hardware Error Log entries are described as part of the following INADS Link test description.

System Technician-Demanded Tests: Descriptions and Error Codes

The **test inads-link** command is different from other test commands in that the:

- Command does not have a long or short option
- Resulting test does not have an associated test number.

When a user issues the **test inads-link** command, the system immediately returns either the `Command successfully completed` or `Command failed` message.

INADS Link Test (No Test Number)

The INADS Link test attempts to call an alarm receiver (in the background) to verify the communications link with the alarm receiver. When a user issues the **test inads-link** command, the system immediately returns either a `Command successfully completed` or `Command failed` message.

The “Command successfully completed” message means the switch will attempt attempt to call the alarm receiver in 2 minutes. (This test runs even if Alarm Origination is disabled.) The 2-minute delay provides enough time for a remote technician to hang up the call and thus free up the alarm receiver’s line so that the customer’s switch can call the alarm receiver back. The “Command failed” message appears when either:

- A previously issued **test inads-link** command is in progress
- The system is attempting to report active alarms to the alarm receiver

As any error conditions are encountered during the test, they are logged against the INADS Link MO.

- If the initial test result was `Command successfully completed`, any logged error codes would range from 1–9.
- If the initial test result was `Command failed`, any logged error codes would be 10 or 11.

An error is logged at the alarm receiver even if the call to the alarm receiver finally succeeds. The the alarm receiver’s software (Release 3.2 or later):

1. Recognizes this special “test inads” alarm type
2. Automatically opens and closes a trouble ticket

   Within the trouble ticket, a field containing the description `TESTING INADS LINK` indicates that the ticket was initiated by a **test inads-link** command.

After entering the command, up to 9 minutes can elapse before the switch places the call and the alarm receiver responds. Therefore, to determine whether the call was successful, the Error Log should be examined (using the **inads** category) 10 minutes after successfully issuing the command. Table 458 explains the error codes.

Table 458: INADS Link Test Error Log Entries

Error Code	Test Result	Description / Recommendation
1	0	A test call was successfully placed to the alarm receiver. No trouble found.
2	0	Informative error indicating that alarm origination was disabled at the time of the test. The test runs even though alarm origination is disabled. **1** If desired, enable Alarm Origination via the Maintenance-Related System Parameters screen. **2** Repeat the test.
3	0	The alarm receiver’s connection is currently in use. **1** Wait 10 minutes, and retry this command.

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Table 458: INADS Link Test Error Log Entries *Continued*

Error Code	Test Result	Description / Recommendation
4	0	The alarm receiver did not answer the test call. **1** Verify that the alarm receiver is up and running. **2** Verify the accuracy of the alarm receiver's phone number and the system's product ID using the Maintenance-Related System Parameters screen. **3** Enable alarm origination using the Maintenance-Related System Parameters screen. Test the SYSAM (System Access Maintenance) by issuing **test maintenance a | b**. **S8100**: Test the PR-MAINT (Maintenance/Tape Processor) by issuing the **test processor a|b** command. If PR-MAINT Tests #102 and #103 do not pass, then refer to PR-MAINT on page 1531. **4** Retry the command.
5	0	The alarm receiver's phone number is not assigned. **1** Assign the alarm receiver's phone number via the Maintenance-Related System Parameters screen. **2** Retry the command.
6	0	The alarm receiver did not return an acknowledgment for the "test inads alarm" message. **1** Verify the accuracy of the alarm receiver's phone number and the system's product ID via the Maintenance-Related System Parameters screen. **2** Verify that the alarm receiver is up and running. **3** Retry the command.
7	0	The alarm receiver returned a negative acknowledgment for the `TESTING INADS LINK` message. **1** Verify that the product IDs match in the customer's switch and the alarm receiver's database. Use the Maintenance-Related System Parameters screen to identify the product ID of the switch. **2** Rerun the test.
8	0	Internal system error. System received an invalid return code.
9	0	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
10	0	A **test inads-link** command is already in progress. **1** Wait 10 minutes for the current command to finish. **2** Review the current command's results by viewing the Error Log and selecting the category "inads-link."

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Table 458: INADS Link Test Error Log Entries *Continued*

Error Code	Test Result	Description / Recommendation
11	0	The switch is trying to report alarms to the alarm receiver. The test cannot be run at this time. **1** Wait 10 minutes, and retry the command.

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IPMEDPRO (IP Media Processor Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
IPMEDPRO	MAJOR	**test board *location* sh**	IP Media Processor circuit pack
IPMEDPRO	MINOR	**test board *location* l**	IP Media Processor circuit pack
IPMEDPRO	WARNING	**test board *location* sh**	IP Media Processor circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN2302 (IP Media Processor) circuit pack is the next generation VOIP platform. The TN2302 includes a 10/100 BaseT Ethernet interface to support IP audio for IP trunks and H.323 endpoints. The TN2302 can perform echo cancellation, silence suppression, DTMF detection, and conferencing. It supports the following codecs, fax detection for them, and conversion between them:

- G.711 (mu-law or a-law, 64 kbps)
- G.723.1 (6.3-kbps or 5.3-kbps audio)
- G.729A (8-kbps audio)

The TN2302 circuit board is used to provide voice over IP connectivity. The TN2302 to acts as a service circuit to terminate generic RTP streams used to carry packetized audio over an IP network. As part of the overall H.323 implementation, the TN2302 circuit pack handles the audio streams while the TN799DP C-LAN handles the TCP/IP signaling channels. This MO applies only to a TN2302.

Error Log Entries and Test to Clear Values

Table 459: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
Body					
0[1]	0	Any	Any	Any	**test board** *UUCSS*
1 (a)	0	Circuit pack removed or SAKI test (#53)	MIN/WRN	OFF	
18 (b)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board** *UUCSS*
23 (c)	0	Board administered but not inserted	WARNING	OFF	**add ds1** *UUCSS*
125 (d)	none	Wrong board	MINOR	ON	
257 (e)	65535	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **l r 20**

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Table 459: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
513 (f)	4352, 4353, 4355, 4356, 4358	TN2302 on-board hardware errors	MINOR	ON	
769 (g)		2-Way Transmission tests (#1505 & 1506)	MINOR	OFF	
1025 (h)	Any	FPGA Query test (#1406)	MINOR		
1281 (i)	Any	TSI Health Query test (#1406)			
1538 (jj)	Any	Circuit pack is hyperactive	MINOR	ON	
1793	Any	NIC Loss of Signal	MIN/WRN[2]		**test board** *UUCSS* **l r 2**
2049 (k)	Any	PPC Sanity Query test (#1406)			
2305 (l)	Any	IP Address Update			
2561(m)		Ping error			
2817 (n)	Any	Ethernet Hardware Query test (#1406)			
3073 (o)	Any	Circuit pack reset test (#53)			
3840, 3841(p)		Inconsistent downlink or board error			
3999 (q)	Any	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to warning alarms based on values set in the **set options** command.

Notes:

a **Error Type 1** — Indicates that the circuit pack has been removed from the system or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed, or 11 minutes after the SAKI test (#53) fails.

To be fully administered, a IPMEDPRO circuit pack must meet four conditions:

- Have an entry in the circuit pack screen (**change circuit-pack**)
- Have the MedPro IP address administered (**change node-names**)
- Be enabled (**change ipserver-interface**)
- Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit pack screen and either of the other conditions are not met, a MINOR alarm is logged. To resolve the error:

- Make sure every condition for administration is met, and that a functioning MedPro circuit pack is inserted in the correct slot.

- Completely remove the IPMEDPRO from the system:
  - **a** Remove the administered IP-Interface associated with the circuit pack.
  - **b** Physically remove the circuit pack from the slot.
  - **c** Execute **remove medpro *UUCSS*** and **change circuit-pack *UUCSS***.

b **Error Type 18** — The IPMEDPRO interface circuit pack has been busied out by a **busyout board *UUCSS*** command.

1 Release the circuit pack (**release board *UUCSS***).

c **Error Type 23** — The IPMEDPRO circuit pack is not completely administered. To be fully administered, an IPMEDPRO circuit pack must meet ***all*** of these four conditions:

- Have an entry in the circuit plan (**change circuit-pack**)
- Have the IPMEDPRO IP address administered (**change node-names**)
- Be enabled (**change ipserver-interface**)
- Be physically inserted into the correct slot.

A DS1 (IPMEDPRO, MEDPRO, MAPD, UDS1-BD and DS1-BD) differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered.

d **Error Type 125** — No Aux Data: The wrong circuit pack is inserted in the slot where this circuit pack is logically administered. Do one of the following:

- Remove the wrong circuit pack and insert the logically administered circuit pack.
- Re-administer this slot to match the circuit pack inserted (**change circuit-pack**).

e **Error Type 257** — Associated with a failure of the Control Channel test (#52). See Control Channel Loop-around Test (#52) on page 1090 for details.

f **Error Type 513** — Indicates different hardware device problems on the board. They include an external RAM failure, and internal RAM failure, a ROM checksum failure, message corruption, and a program logic inconsistency. The counter can be alarmed if it goes over threshold. There are no associated tests for these inline errors; if they continue to happen, an alarm will occur, otherwise the counter will be decremented via the leaky bucket.

g **Error Type 769** — This error indicates failed attempts to verify IP network connectivity between a specified IP Media Processor and other IP Media Processor/s in the system. See Test #1505 for Short IP 2-way transmission test failures and Test #1506 IP long 2-way transmission test failures.

h **Error Type 1025** — Indicates FPGA failure, associated with a problem on the FPGA device located on the TN2302. The last byte of the inline error gives a hint as to the problem with the FPGA. The diagnostic strategy for this inline error is to take the switch resources associated with every DSP out of service, and then to reset the FPGA. The reset of the FPGA will cause an uplink response as to whether the reset passed or not. There are several error conditions that can be sent up in the error message for the FPGA; they will all be treated as the same failure by switch software. For the repair procedure, see associated Test #1406.

i **Error Type 1281** — Indicates TSI failures. There are potentially 2 different TSI failures that can occur: one is a TSI DSP failure, and the other is a TSI FPGA failure. Both of these failures will be looked for by switch software, but they will both cause the same response by software. The diagnostic strategy for this inline error is to take the switch resources associated with every DSP out of service, and then reset the TSI (the reset downlink is slightly different depending on whether the TSI DSP or the TSI FPGA is to be reset). The reset of the TSI will cause an uplink response as to whether the reset passed or not. There are several error conditions that can be sent up in the error message for the TSI; they will all be treated as the same failure by switch software. For the repair procedure, see associated Test #1406.

j **Error Type 1538** — Used to indicate hyperactivity on the board. Hyperactivity on a circuit pack is when the angel is sending too many CCMS messages uplink, 400 per ten seconds for the TN2302, to switch software. The circuit pack will be taken out of service. See Error Type 3999.

k **Error Type 2049** — Indicates that the processor, specifically the Power PC, 860T hardware is failing. The PPC provides the Angle functionality as well as the UDP/IP interface; an attempt is made to reset the board automatically. For the repair procedure, see associated Test #1406. If the reset fails, the board is probably bad and should be replaced.

l **Error Type 2305** — Indicates an IP address inconsistency between switch software and the IPMEDPRO board. If this error occurs, an attempt will be made to download the IP address again. If the board still refuses the IP address, the board will be reset.

m **Error Type 2561** — Indicates that the ping test has failed. The diagnostics that are run by this failure start up analysis testing and rerun the test. Testing will continue until the problem is cleared. However, once the counter reaches threshold, an attempt will be made to refresh the IP address to the board.

n **Error Type 2817** — Indicates an Ethernet hardware failure on the TN2302 circuit pack. The diagnostic strategy for this inline error is to take the switch resources associated with every DSP out of service and then reset the Ethernet hardware. The reset of the Ethernet hardware will cause an uplink response as to whether the reset passed or not. There are several error conditions that can be sent up in the error message for this problem; they will all be treated as the same failure by switch software. For the repair procedure, see associated Test #1406.

o **Error Type 3073** — Associated with a circuit board reset. The diagnostic strategy for these inline errors is to take the switch resources associated with every DSP out of service and then reset the board, as the failure of the Scotch is severe enough to warrant a board reset. After the board reset a query can be made again for the health of the Scotch devices to verify whether they are OK. If they are, the alarm and counters will be cleared; if not, the alarm will be left up, every DSP will be left out of service, and maintenance diagnostics will stop. If the board continues to fail with this error type, replace the TN2302.

p **Error Types 3840, 3841** — Indicate inconsistent downlink message. These errors are not service affecting. No action is required.

q **Error Type 3999** — Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack was taken out of service due to hyperactivity. If Error Type 1538 is not present, then the circuit pack has not been taken out of service, but it has generated 50 percent of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented in Table 460. By clearing error codes associated with the *Control Channel Loop test,* for example, you may also clear errors generated from other tests in the testing sequence.

Table 460: System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Control Channel Loop test (#52)	X	X		ND
SAKI Sanity test (#53)		X	X	D
IP Address query (#1371)	X	X		D
NIC Query test (#1383)	X	X		ND
Local Ping test (#1379)	X	X		ND
MP Diagnostic test (#1406)		X	X	D
Short IP 2-Way Transmission test (#1505)	X			ND
Long IP 2-Way Transmission test (#1506)		X		ND

1 D = Destructive; ND = Nondestructive

Control Channel Loop-around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 461: Test #52 Control Channel Loop-around Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The circuit pack failed to return the circuit pack code or vintage. **1** Retry the command up to 5 times. **2** If the problem continues, replace the circuit pack. **3** Retry the command up to 5 times.
	PASS	Communication with this circuit pack is successful.

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Table 461: Test #52 Control Channel Loop-around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Administer the MedPro interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseat the board to reinitialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board *UUCSS***. **4** Issue the r**eset board *UUCSS*** command. **5** Issue the **release board *UUCSS*** command. **6** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

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SAKI Sanity Test (#53)

This test is **destructive**.

This test is only run as a part of a reset board procedure. For the Media Processor, use the **change ipserver-interfaces** screen to disable the media processor's IP interface before performing this reset board procedure. Other common circuit packs can be reset with **reset board *UUCSS***, which also executes this test.

A reset of this circuit pack takes about 3½ minutes.

Table 462: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out of service. **1** Busy out the circuit pack. **2** Execute command again.
2100	ABORT	System resources required for this test are not available. Retry the command at 1-minute intervals up to 5 times.

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Table 462: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
2803	ABORT	It is necessary to reset the board. **1** Use the change ip-interfaces screen to disable the media processor's IP interface. **2** Execute the command again.
1	FAIL	The circuit pack failed to reset. **1** Execute command again. **2** If the problem persists, replace the circuit pack.
2, 2000	FAIL	The circuit pack failed to restart. **1** Execute command again. **2** If the problem persists, replace the circuit pack.
	PASS	The circuit pack initializes correctly. Run the short test sequence.
Any	NO BOARD	This is normal if the test is being done when (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals for up to 5 times.

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IP Address Query Test #1371

This test is **destructive**.

This test sends the media processor the IP address, subnet mask, and gateway translation (IP parameters). If the parameters do not match software translation, the maintenance sub-system reboots the board. The board goes through a physical board removal and insertion.

When this test fails, it is an indication that an illegal change was made and the customer should be notified.

Table 463: Test #1371 IP Address Query Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Insufficient system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2801	ABORT	Unable to find IP address data for this location. **1** Verify that the board is administered.
2807	ABORT	The board is administered, but not enabled in the **change ip-interfaces** screen.
S8100:	FAIL	The IP address, subnet mask, and gateway translation parameters do not match Communication Manager translations. The board must be physically removed and re-inserted. **1** If the problem persists, replace the circuit pack.
S8100:	PASS	Translation data matches.

NIC Query Test (#1383)

This test is **non**destructive.

This test passes if the Ethernet port is connected, and you can talk on the network. Otherwise, it fails with no fail code or AUX data.

Table 464: Test #1383 NIC Query Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out of service. **1** Enter **busyout board *UUCSS*** to busyout the circuit pack. **2** Execute the command again.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Ethernet port is not connected, and you cannot talk on the network.
	PASS	The Ethernet port is connected, and you can talk on the network.

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Table 464: Test #1383 NIC Query Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board's translations are correct. **2** If the board is not correctly administered, administer the MedPro interface. If correctly administered, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseat the board to reinitialize it. **3** If the board is correctly inserted and administered, issue **busyout board *UUCSS***. **4** Issue the **reset board *UUCSS*** command. **5** Issue the **release board UUCSS** command. **6** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

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Ping Test (#1379)

This test is **non**destructive.

This test verifies that the MedPro circuit pack can communicate to other nodes on the LAN.

This test also pings the gateway IP address as defined on the IP Interface screen. If the PING is successful, this test looks at the PING round-trip delay. If a round-trip delay of greater than 4 seconds is reported, a separate error is logged. Excessive round-trip delays do not take the MedPro out of service.

Services can execute the standard PING command using the C-LAN board address and MedPro IP address to see the actual round-trip delay. (See **ping** commands.)

This test is a nondestructive test. It runs due to in-line errors, during periodic and scheduled maintenance, and on demand.

Table 465: Test #1379 Ping Test

Error Code	Test Result	Description / Recommendation
1, 2	ABORT	Internal Error. **1** Retry the command at 1-minute intervals up to 3 times.
7	ABORT	Destination unreachable. **1** Verify that at least one destination reachable through this port is up. **2** Repeat the test. **3** If the test still aborts, escalate the problem.
2000	ABORT	Response to the test was not received from the Media Processor circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack. Reset the circuit pack by issuing the busyout board UUCSS and the reset board UUCSS commands. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	The necessary system resources to execute the test could not be allocated. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	No IP address defined. Verify IP interfaces translations and retest.
2802	ABORT	Different IP address pinged than software had allocated for the test. **1** Retry the command at 1-minute intervals up to 3 times.
2805	FAIL	The number of pings received did not match the number sent (normally one ping sent). This means that no ping responses were received from the gateway defined on the **ip-interfaces** screen for the media processor. **1** Retry the command at 1-minute intervals up to 3 times.
2807	ABORT	The board is administered but not enabled in the **change ip-interfaces** screen.
7, 89, 1007	FAIL	A ping to the destination failed through this port. This failure is because the destination is down. **1** Verify that at least one destination is reachable through this port. **2** Once verified, execute the **test port *UUCSSpp*** command to verify that the H.323 Signaling Group Ping test (#1387) passes.
	PASS	Ping through this port is successful.

MP Diagnostic Test (#1406)

This test is **destructive**.

The MP Diagnostic test (#1406) runs the following diagnostic tests in the following order, but only if each successive test passes:

1. FPGA Query
2. TSI Query
3. ETHERNET Query
4. SCOTCH Sanity

FPGA Query

This test passes if the FPGA device on the TN2302 tests okay. Otherwise, it fails with no fail code or AUX data.

This test verifies the status of the FPGA device on the TN2302 circuit pack. If the device is bad, software sets an appropriate counter, posts an error and alarm, and takes every DSP out of service (every DSP is controlled by the one FPGA). Software then attempts to reset the FPGA. If the reset passes or the original test passes, the DSPs are placed into service.

TSI DSP Query

This test passes if the TSI device on the TN2302 tests okay. Otherwise, it fails with no fail code or AUX data.

This test verifies the status of the TSI device on the TN2302 circuit pack. If the device is bad, software sets an appropriate counter, posts an error and alarm, and takes every DSP out of service (every DSP is controlled by the one TSI). Software then attempts to reset the TSI. If the reset passes or the original test passes, the DSPs are placed into service.

Ethernet Query

This test passes if the TN2302 hardware tests ok and the Ethernet port is connected. Otherwise, it fails with no fail code or AUX data.

SCOTCH Sanity

The Scotch device on a board communicates with switch software via the TDM bus for conferencing and gain adjustment. This is done by setting up connections on TDM bus time slots.

There are three different inline errors that can be generated due to the Scotch devices on the board: NPE SCOTCH 0, NPE SCOTCH 1, and NCE SCOTCH. If any of these errors are reported from the board, the DSPs are taken from service and a circuit pack reset is executed by running the SAKI test.

Table 466: Test #1406 MP Diagnostic Test

Error Code	Test Result	Description / Recommendation
2012	ABORT	System error: **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The MP Diagnostic test has failed for this TN2302 and the board is in the out-of-service state. **1** Issue the **busyout board *UUCSS*** command. **2** Issue the **reset board *UUCSS*** command. **3** Issue the **release board *UUCSS*** command. **4** Issue the **test board *UUCSS* long** command. If the board continues to fail, replace the board.
8192–8328	FAIL	The FPGA DSP test failed: **1** Issue the **busyout board *UUCSS*** command. **2** Issue the **reset board *UUCSS*** command. **3** Issue the **release board *UUCSS*** command. **4** Issue the **test board *UUCSS* long** command. If the board continues to fail, replace the board.
8448–8584	FAIL	The TSI FPGS test failed: **1** Issue the **busyout board *UUCSS*** command. **2** Issue the **reset board *UUCSS*** command. **3** Issue the **release board *UUCSS*** command. **4** Issue the **test board *UUCSS* long** command. If the board continues to fail, replace the board.
12288–12424	FAIL	The TSI DSP test failed: **1** Issue the **busyout board *UUCSS*** command. **2** Issue the **reset board *UUCSS*** command. **3** Issue the **release board *UUCSS*** command. **4** Issue the **test board *UUCSS* long** command. If the board continues to fail, replace the board.
16384–16900	FAIL	A SCOTCH device failed: **1** Issue the **busyout board *UUCSS*** command. **2** Issue the **reset board *UUCSS*** command. **3** Issue the **release board *UUCSS*** command. **4** Issue the **test board *UUCSS* long** command. If the board continues to fail, replace the board.

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Table 466: Test #1406 MP Diagnostic Test

Error Code	Test Result	Description / Recommendation
24576–24580	FAIL	An ETHERNET device failed: **1** Issue the **busyout board *UUCSS*** command. **2** Issue the **reset board *UUCSS*** command. **3** Issue the **release board *UUCSS*** command. **4** Issue the **test board *UUCSS* long** command. If the board continues to fail, replace the board.
	PASS	The FPGA device on this TN2302 is operating correctly.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Administer the IPMEDPRO interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseat the board to reinitialize it. **3** If the board was found to be correctly inserted in step 1, then issue **busyout board *UUCSS***. **4** Issue the **reset board *UUCSS*** command. **5** Issue the **release board *UUCSS*** command. **6** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

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Short IP 2-Way Transmission Test (#1505)

This test is **non**destructive.

Short IP 2-way transmission test is run for the periodic, scheduled, analysis and short demand tests.

This test attempts to verify IP network connectivity between one pair of IP Media Processors that are connected to a customer's LAN/WAN IP network.

This test creates a G.711 audio path between the source IP Media Processor board specified in the command line and a destination IP Media Processor board. The destination media processor board is chosen by the system. The destination media processor is chosen from a port network other than the port network containing the source media processor. In addition, the destination media processor board is chosen from the same IP network region as the source media processor board or is chosen from an IP network region that is administered to be connected to the IP network region of the source media processor board.

An audio channel using G.711 is setup between both boards. A 1004-Hz test tone is transmitted from the source PN to the destination PN over the G.711 audio channel. The test tone is then transmitted from the destination PN to the source PN.

Table 467: Short IP 2-Way Transmission Test (#1505)

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions or it may have timeslots out of service due to TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times. **2** If system has TDM-BUS errors, clear any errors, and retry the command at 1-minute intervals up to 3 times. **3** If the command continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. Even without TTR-LEV errors, a Tone Detector could be unavailable in the PN containing the circuit pack being tested. Verify that at least one Tone Detector resides in this PN. If not, this test always aborts, but does not harm the system. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2012	ABORT	Generic system call failed. Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	The IP Media Processor board has not been administered on the ip-interfaces screen.
2804	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2806	ABORT	The system could not find any in-service IP Media Processor boards to use as a destination for this test.
2807	ABORT	The specified IP Media Processor board has been disabled on the ip-interfaces screen.

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Table 467: Short IP 2-Way Transmission Test (#1505)

Error Code	Test Result	Description / Recommendation
10XX XX = PN #	FAIL	The test tone was not successfully sent from the IP Media Processor specified in the test command and not successfully received by an IP Media Processor in the PN specified in the error code (XX). XX = PN number. The source to destination direction failed. The destination to source direction was not tested. **1** Resolve all other board alarms for the specified source IP Media Processor. **2** Resolve all other board alarms for the IP Media Processor boards in the destination PN. **3** Use **ping** and **traceroute** to localize the problem to the customer's LAN/WAN IP network.
20XX XX = PN #	FAIL	The test tone was successfully sent from the IP Media Processor specified in the test command and received by an IP Media Processor in the PN specified in the error code (XX). XX = PN number. The test tone was not successfully sent in the reverse direction. The destination to source direction failed. The source to destination direction passed. **1** Resolve all other board alarms for the specified source IP Media Processor. **2** Resolve all other board alarms for the IP Media Processor boards in the destination PN. **3** Use **ping** and **traceroute** to localize the problem to the customer's LAN/WAN IP network.
XX XX = PN #	PASS	The board is functioning properly. The test tone was transmitted and received successfully between: • The IP Media Processor specified in the test command • An IP Media Processor in the PN specified in the error code (XX). (The test tone was sent and received in both directions). XX = PN number.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the NCE chip on board may be bad. Replace the board and retest.

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Long IP 2-Way Transmission Test (#1506)

This test is **non**destructive.

Long IP 2-Way Transmission test is run for the long demand test only.

This test is used to verify IP network connectivity between a specified IP Media Processor and every other IP Media Processor in the system. It is an extended version of Test #1505.

In Test #1505 we verify IP voice connectivity in both directions, between the specified IP Media Processor (A) and a system chosen destination IP Media Processor (B).

In Test #1506 we verify IP voice connectivity in both directions, between the specified IP media Processor (A) and all other IP Media Processor/s (B, C, D, E, ...) that has administered IP network region connectivity to the IP network region, of the source IP Media Processor.

The test passes if the source IP Media Processor (A) has 2-way voice connectivity to all other IP Media Processors. The test fails and stops immediately when the source IP Media Processor (A) cannot verify 2-way talk path to any destination IP Media Processor. The failure code indicates the port network that contains the destination media processor that could not be reached.

This test creates a G.711 audio path between the source IP Media Processor board specified in the command line and a destination IP Media Processor board. All destination media processor boards are chosen from the same IP network region as the source IP Media Processor and connected IP network regions. An audio channel using G.711 is setup between a pair of boards. A 1004-Hz test tone is transmitted from the source PN to the destination PN over the G.711 audio channel. The test tone is then transmitted from the destination PN to the source PN.

Table 468: Long IP 2-Way Transmission Test (#1506)

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions or it may have timeslots out of service due to TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times. **2** If system has TDM-BUS errors, clear any errors, and retry the command at 1-minute intervals up to 3 times. **3** If the command continues to abort, escalate the problem.

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Table 468: Long IP 2-Way Transmission Test (#1506)

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. Even without TTR-LEV errors, a Tone Detector could be unavailable in the PN containing the circuit pack being tested. Verify that at least one Tone Detector resides in this PN. If not, the test always aborts for this circuit pack, but does not harm the system. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2012	ABORT	Generic system call failed. Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	The IP Media Processor board has not been administered on the ip-interfaces screen.
2804	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2806	ABORT	The system could not find any in-service IP Media Processor boards to use as a destination for this test.
2807	ABORT	The specified IP Media Processor board has been disabled on the ip-interfaces screen.
10XX XX = PN #	FAIL	The test tone was not successfully sent from the IP Media Processor specified in the test command, and not successfully received by an IP Media Processor in the PN specified in the error code (XX). Source to destination direction failed. Destination to source direction not tested. XX = PN number. **1** Resolve all other board alarms for the specified source IP Media Processor. **2** Resolve all other board alarms for the IP Media Processor boards in the destination PN. **3** Use **ping** and **traceroute** to localize the problem to the customer's LAN/WAN IP network.

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Table 468: Long IP 2-Way Transmission Test (#1506)

Error Code	Test Result	Description / Recommendation
20XX	FAIL	The test tone was successfully sent from the IP Media Processor specified in the test command and received by an IP Media Processor in the PN specified in the error code (XX). The test tone was not successfully sent in the reverse direction. Destination to source direction failed. Source to destination direction passed. **1** Resolve all other board alarms for the specified source IP Media Processor. **2** Resolve all other board alarms for the IP Media Processor boards in the destination PN. **3** Use **ping** and **traceroute** to localize the problem to the customer's LAN/WAN IP network.
	PASS	The customer network is functioning properly. The test tone was transmitted and received successfully between: • The IP Media Processor specified in the test command • Every other IP Media Processor in the set of connected IP network regions.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. **2** Check that the board is properly translated and inserted. **a** If so, check for hyperactivity (Error 1538). **b** If hyperactive, use the reset board UUCSS command. **3** Run the test again. If it fails, the NCE chip on board may be bad. Replace the board and retest.

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IPSV-CTL (Ipserver Interface Control)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
IPSV-CTL	NA	**set ipserver-interface**	Ipserver Interface Control

The TN2312AP IPSI and TN2312BP circuit packs are duplicated in a high- or critical-reliability system. As part of duplicated IPSIs, PKT-INTs, Archangels, and Tone-Clocks are also duplicated. However, to simplify recovery algorithms, only one IPSI can be "active" in a given PN. The one exception to this rule is the IPSI's tone-detection module. Both IPSIs may have active tone detectors.

NOTE:
The TN2312BP IPSI is a replacement for the TN2312AP IPSI and can be used anywhere a TN2312AP is used. The TN2312AP is not compatible with CMC1and G650 media gateways.

During an IPSI interchange, the IPSI's PKT-INTs, Archangels, and Tone-Clocks are temporarily distributed between the two IPSIs. During stable operation, the active PKT-INT, Archangel, and Tone-Clock must all reside on the same IPSI.

S8700 IP: In an S8700 IP-connect configuration, IPSI capabilities are provided by a single IPSI, not shared by two IPSIs. All IPSI capabilities that are functioning are provided by a single IPSI in an IP-connect configuration. This differs from multi-connect configurations in which the EAL can be in an expansion interface (EI) circuit pack during a recovery operation. (S8700 IP-connect configurations do not contain EI circuit packs.)

Each IPSI's state of health (SOH) is based on the following elements in descending order of priority:

Table 469: Fault classes and IPSI interchanges

Fault Class	Circuit pack function that is monitored	Priority
Clock	Clocking signal for the TDM bus	1 (highest)
PKTINT	Sending and receiving packet control messages	2
EAL	Noting the state of the expansion archangel link (up or down)	3
Generation	Generating tones	4 (lowest)

NOTE:
A low priority fault indicates a better state-of-health than a high priority fault. For example, a clock fault on an IPSI is more severe that a PKTINT fault on an IPSI.

The active media server's maintenance software is responsible for maintaining the SOH of both the active and standby IPSI in each PN. If an active IPSI's SOH is lower than the standby's, IPSI interchange is initiated. The following list contains failures and actions that cause an interchange:

- Active IPSI has a faulty Tone-Clock.
  1. IPSI's hardware detects loss of clock, and its firmware initiates clock interchange.
  2. IPSI's firmware notifies software of loss of clock.
  3. Software interchanges PKT-INT.
  4. Software interchanges Archangel.
- Active IPSI has a faulty PKT-INT.
  1. Software detects faulty PKT-INT.
  2. Software interchanges PKT-INT.
  3. Software interchanges Archangel.
  4. Software interchanges Tone-Clock.
- Active IPSI has a faulty Archangel.
  1. PKT-INT detects dead EAL and reports it to software.
  2. Software interchanges PKT-INT.
  3. Software interchanges Archangel.
  4. Software interchanges Tone-Clock.
- Both IPSIs are healthy (planned interchange sequence).
  1. Software interchanges Tone-Clock.
  2. Software interchanges PKT-INT.
  3. Software interchanges Archangel.

If both of a PN's IPSIs have faulty Tone-Clock, then the PN is out of service.

If both of a PN's IPSIs have faulty EAL and/or PKT-INT, then the PN "falls back" to EI-EAL mode of operation, where:

- The PN's Expansion Interface circuit pack (EI) provides Archangel functionality
- Another PN's IPSI provides PKT-INT functionality

For details, see EXP-INTF (Expansion Interface Circuit Pack) on page 911.

Table 470, IPSI A is Active, on page 1105, Table 471, IPSI B is Active, on page 1106, Table 472, IPSI A Provides Tone-Clock; Fall-Back to EI-EAL, on page 1106, and Table 473, IPSI B Provides Tone-Clock; Fall-Back to EI-EAL, on page 1106 show the valid combinations of IPSIs and EIs providing Tone-Clock, PKT-INT, and Archangel functions.

Table 470: IPSI A is Active

Function	IPSI A	IPSI B	EI	IPSI in Another PN
Tone-Clock	X			
PKT-INT	X			
Archangel	X			

Table 471: IPSI B is Active

Function	IPSI A	IPSI B	EI	IPSI in Another PN
Tone-Clock		X		
PKT-INT		X		
Archangel		X		

Table 472: IPSI A Provides Tone-Clock; Fall-Back to EI-EAL

Function	IPSI A	IPSI B	EI	IPSI in another PN
Tone-Clock	X			
PKT-INT				X
Archangel			X	

Table 473: IPSI B Provides Tone-Clock; Fall-Back to EI-EAL

Function	IPSI A	IPSI B	EI	IPSI in Another PN
Tone-Clock		X		
PKT-INT				X
Archangel			X	

System Configurations with Duplicated IPSIs

Figure 83, Duplicated IPSI Duplicated Direct Connect PNC Connectivity, on page 1107 shows a critical-reliability system with duplicated IPSIs and directly connected PNCs.

Figure 84, Duplicated IPSI Duplicated PNC with Center Stage Switch Connectivity, on page 1108 shows a critical-reliability system with duplicated IPSIs and CSS-connected PNCs.

Table 474, Cabinets that support IPSI and IPSI duplication, on page 1108 shows a complete list of cabinets.

Figure 83: Duplicated IPSI Duplicated Direct Connect PNC Connectivity

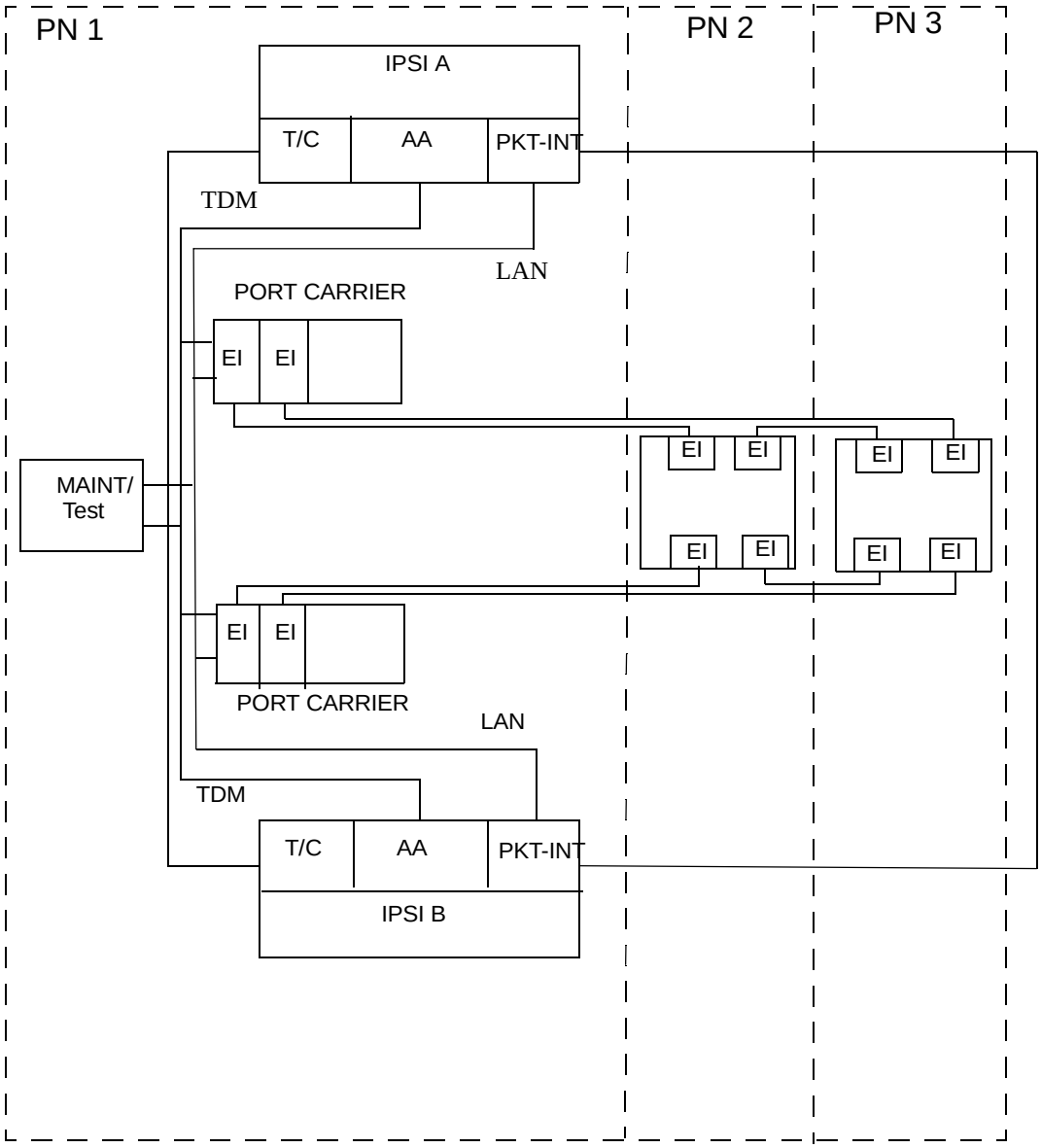

Figure 84: Duplicated IPSI Duplicated PNC with Center Stage Switch Connectivity

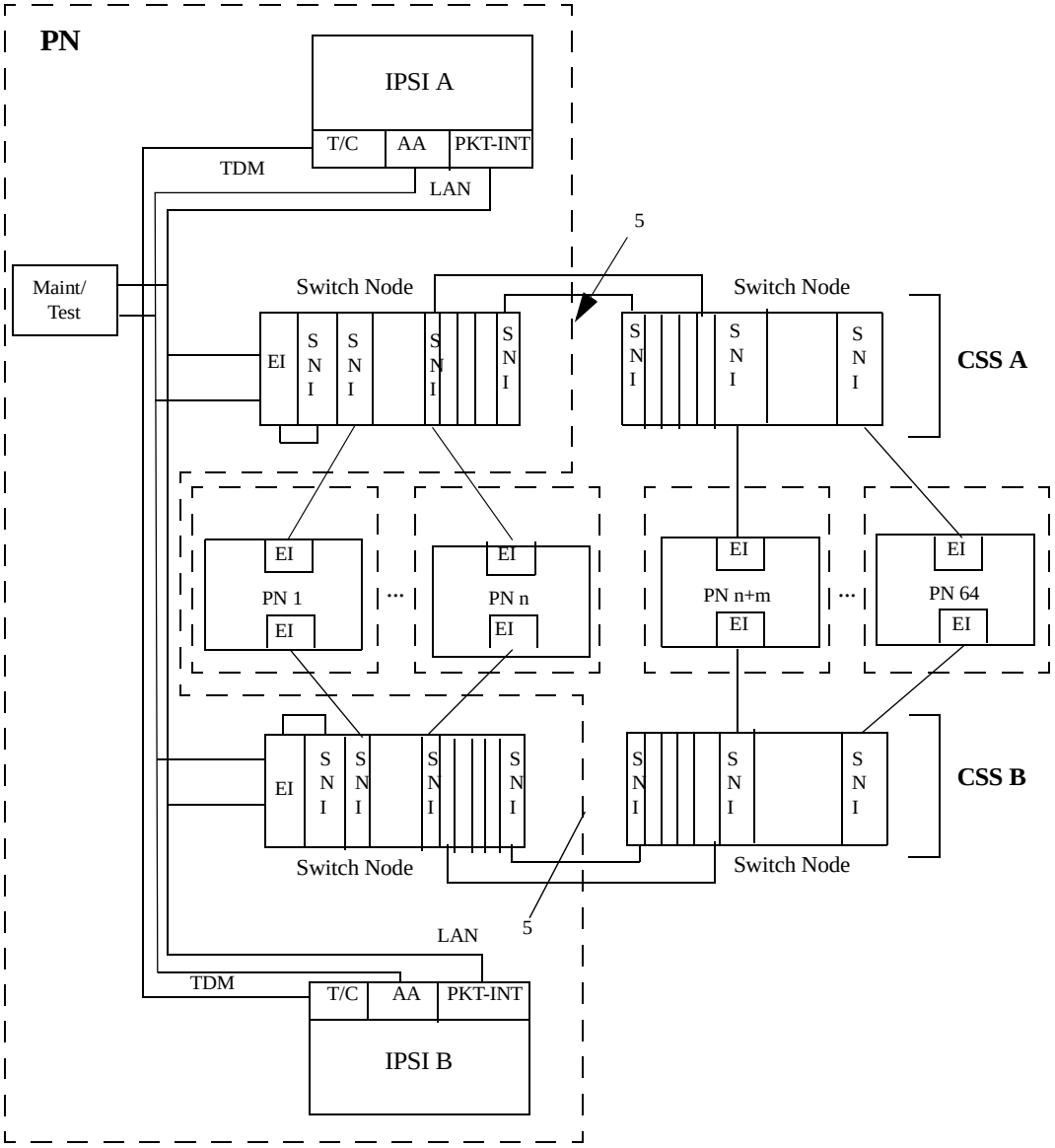

Table 474: Cabinets that support IPSI and IPSI duplication

Cabinet type	Supported IPSI		Duplication	
	TN2312AP	TN2312BP	Primary slot	Secondary slot
SCC1 EPN Stack	Y	Y	A00	B01
MCC1 EPN - 1 PN	Y	Y	A00	B01

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Table 474: Cabinets that support IPSI and IPSI duplication

Cabinet type	Supported IPSI		Duplication	
	TN2312AP	TN2312BP	Primary slot	Secondary slot
MCC1 EPN - 2 PNs	Y	Y	A00	B01
			E02	D01
MCC1 EPN - 3PNs	Y	Y	A00	N/A
			B02	N/A
			D02	N/A
MCC1 EPN - 4 PNs	Y	Y	A00	N/A
			B02	N/A
			C02	N/A
			D02	N/A
MCC1 EPN - 5 PNs	Y	Y	A00	N/A
			B02	N/A
			C02	N/A
			D02	N/A
			E02	N/A
G600	Y	Y	A02	N/A
CMC1 PN	N	Y	A02	N/A
G650 Stack	N	Y	A01	B01

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Error Log Entries

Whenever an IPSI interchange takes place, an error is logged against IPSV-CTL with a code that conveys information about the cause of the interchange and which IPSI became active.

Use Table 475, Error Code Descriptions and Aux Data, on page 1110, Table 476, Encoding of Error Codes for Software Requested IPSI interchange, on page 1110, Table 477, Aux Data Descriptions for Software-Requested Interchange, on page 1111, and Table 478, Error codes for set ipserver-interface, on page 1112 to help identify areas of the Alarm Log to investigate to find the source of the problem.

Table 475: Error Code Descriptions and Aux Data

Error Code	Description	Aux Data
3wxyz[1]	Software requested IPSI interchange / control change[2]	See Table 477.
50000	Craft demand interchange of IPSI to A side	See Table 477
51000	Craft demand interchange of IPSI to B side	See Table 477
60000	Daily interchange of IPSI to standby failed	0
61000	Daily interchange of IPSI back to previous active failed	0

1 See following Table 476 for encoding of the wxyz digits of the error code.

2 Control change is moving the Archangel's functionality to or from the IPSI.

Error Codes for Software-Requested Interchanges

Table 476: Encoding of Error Codes for Software Requested IPSI interchange

Field	Variable Name	Value	Description
w	Active IPSI post action	0	The A-side IPSI is active after the interchange.
		1	The B-side IPSI is active after the interchange.
x	Control (Archangel) pre and post action	0	Control on IPSI before and after the interchange.
		1	Not in IPSI control before and after the interchange.
		2	Control leaves IPSI.
		3	Control moves to IPSI.
y	Fault class/stimulus causing software action	1	EAL fault class
		2	PKT-INT fault class
		3	TONE-BD fault class (not TDM-CLK)
		4	TDM-CLK fault class (loss of clock)
		7	Preference migration to A-side IPSI
z	Fault or improvement	0	This is an improvement in the previous fault class (y).
		1	This is a degradation of the previous fault class (y).

AUX DATA Descriptions

Table 477: Aux Data Descriptions for Software-Requested Interchange

Aux Data	Description
0	No specific extra information is available
1	An IPSI interchange only took place
2	A control change only took place
3	Both an IPSI interchange and a control change took place

Examples:

Error code of 30320 with aux data 2 indicates that software requested the archangel move to the A-side IPSI as a result of a PKT-INT fault class improvement.

Error code of 31041 with aux data 1 indicates a software requested interchange from the A-side IPSI to the B-side IPSI leaving the archangel on the IPSI due to a loss of TDM clock.

IPSI Interchange (Duplicated IPSIs)

Software will take action upon any fault that affects the IPSI and attempt to interchange to the healthier IPSI. In addition, when neither IPSI is completely healthy to provide clock, packet interface and archangel, one IPSI will be chosen to be the clock, and the archangel will move to the EI. Moving the archangel's functionality to the EI requires another port network to have a healthy IPSI, and this port network to have an EI. The exact order of action taken will vary depending on the fault being processed, as well as the existing state of health (SOH) of the IPSIs in the PN. An IPSI interchange (if necessary) will always happen before a control change (moving of the archangel to/from IPSI/EI). If both IPSIs are equally healthy, software preferentially migrates to the A-side IPSI. However, this preferential migration is not done if craft has set to a B-side IPSI.

Craft can also demand an interchange of IPSIs in one or every PN from the SAT. The command **set ipserver-interface *Uc*** is used to interchange a specific IPSI. In addition, **set ipserver-interface a-all | b-all** can be used to interchange every IPSI in the system to the A-side or B-side respectively. This is particularly useful if preparing for a control-network outage. For a planned interchange of IPSIs, the following steps occur. The:

1. Going active IPSI is marked as active, the going standby is marked as standby.
2. Tone-Clock is migrated. This includes tone generation as well as TDM clock.
3. Archangel is migrated to the newly active IPSI.
4. PKT-INT on the newly active IPSI is made active. Every link is migrated between IPSIs.

See Table 478, Error codes for set ipserver-interface, on page 1112 for ABORT/FAIL codes associated with **set ipserver-interface**:

An example of the output of the **list ipserver-interface** command is given below.

Table 478: Error codes for set ipserver-interface

Error Code	Command Result	Description
2343	ABORT	Interchange not permitted. The anti-thrashing timer has not yet expired. **1** Retry command in 30 seconds.
2338	FAIL	The SOH of the set-to IPSI is bad. Use **list ipserver-interface** to display the current IPSI's SOH.
2340	FAIL	The archangel function is not on an IPSI.
2341	FAIL	An error occurred during the interchange.
2342	FAIL	The set-to IPSI has been busied out. **1** Run **release ipserver-interface *Uc***.
	PASS	The interchange was successful, or the set to IPSI was already active. If set to a B-side IPSI, it will be marked as "craft set" and will not preference switch back to the A-side by software.

```
list ipserver-interface

                        IP SERVER INTERFACE INFORMATION

Port Pri/   Primary/         Primary/         Primary/                State Of
Ntwk Sec    Secondary        Secondary        Secondary Serv  Control Health
Num  Bd Loc IP Address       Host Name        DHCP ID   State State   C P E G
---- ------ ---------------  ---------------- --------- ----- ------- -------
  2   2A01  172.18.18.181    172.18.18.181    ipsi-A02a  IN   actv-aa 0.0.0.0

  3   3A02  172.18.18.182    172.18.18.182    ipsi-A03a  IN   actv-aa 0.0.0.0

  8   8A02  192.168.18.40    192.168.18.40    ipsi-A08a  IN   actv-aa 0.0.0.0

 15  15A02  172.18.18.34     172.18.18.34     ipsi-A15a  IN   actv-aa 0.0.0.0

 45  45A02  172.17.17.60     172.17.17.60     ipsi-A45a  IN   actv-aa 0.0.0.0

 51  51A02  172.18.18.81     172.18.18.81     ipsi-A51a  IN   actv-aa 0.0.0.0
```

The state-of-health information contains the fault class information in the far right columns as follows:

- C = Clock
- P = Packet Interface
- E = Expansion Archangel Link
- G = Tone Generation

IP-SVR (IP Server Interface)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
IP-SVR	WARNING	**busyout/release ipserver-interface**	IP Server Interface

TN2312 IP Server Interface Circuit Pack

NOTE:
The only error type reported against this MO is error Type 18. All other error types will be reported against MOs supporting the IPSI circuit pack functional modules, PKT-INT, IPSV-CTL, ETR-PT, TDM-CLK, TONE-PT, TONE-BD, SER-BUS, CAB-EXFR, EXT-DEV, CAB-PFL, POW-SUP, CAB-TEMP, PS-RGEN, CAB-CALM, and CAB-MTCE.

The TN2312 IPSI circuit pack is used by S8700 systems to connect the port networks to the media servers via an IP network and provide port-network control functions.

The TN2312 IPSI is inserted into the PN's Tone-Clock slots and provides interface back to the media servers via Ethernet. See the following list of IPSI circuit-pack functions:

- PKT-INT packet-bus interface
- Archangel TDM-bus interface
- Tone-Clock functionality (equivalent to TN2182C Tone-Clock circuit pack)
- Ethernet interface for connectivity to the media servers
- Ethernet interface for connectivity to Services' laptop PCs
- Maintenance-board interface for communication with the PN's TN775 Maintenance board (TN2312AP)
- Environmental maintenance (TN2312BP)

For S8700 systems, the processors, and the PKT-INTs reside in different cabinets, connected to each other via the control networks. All communication between the media servers and the IPSIs are done over TCP/IP Socket connections. Other than the Ethernet that connects the media servers to the IPSIs, there are no other leads for signaling and resets. All communication between the media servers and the IPSIs must be done via messages over the socket connections.

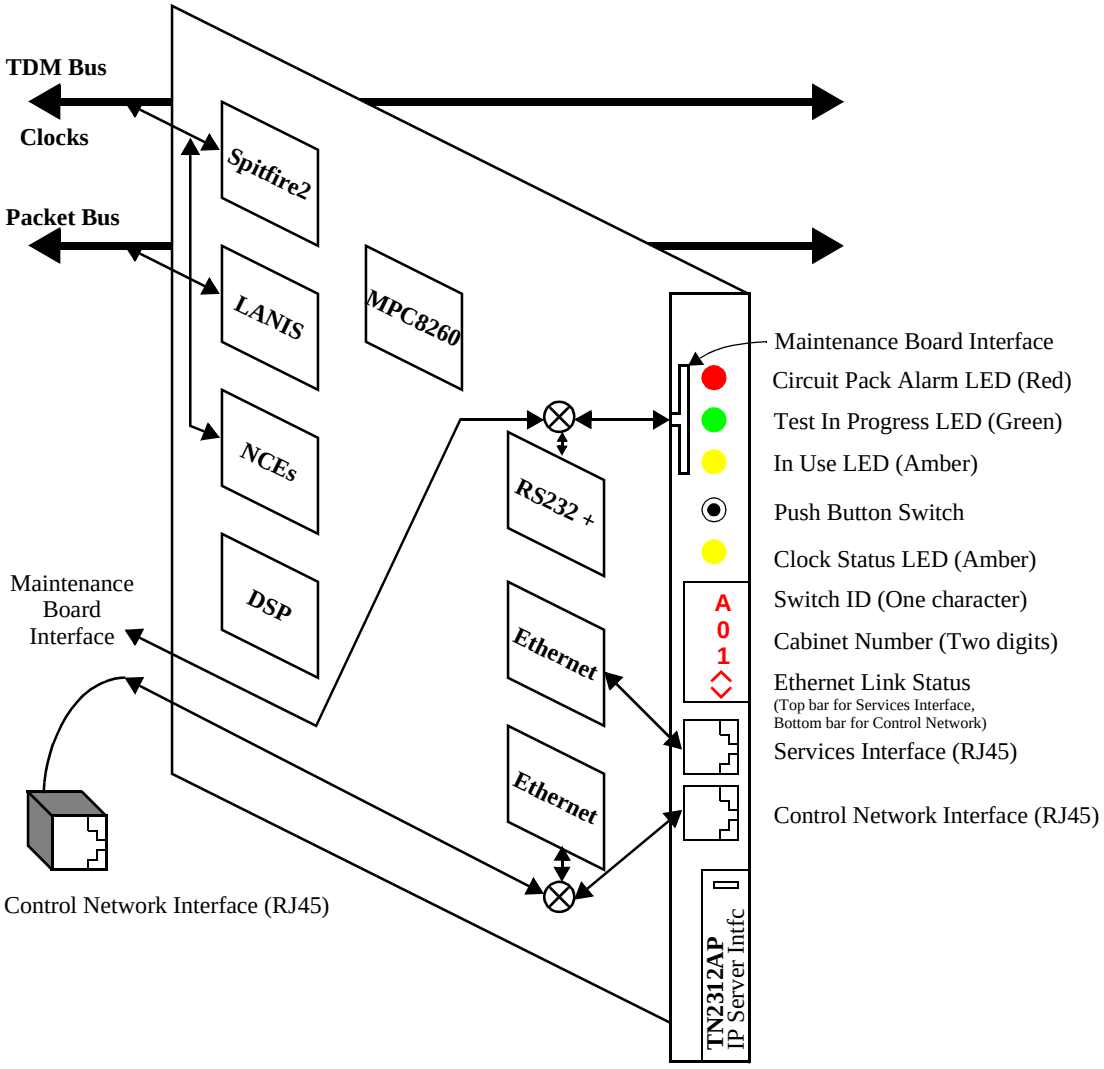
Each IPSI's state of health (SOH) is kept with the following elements in descending order of priority:

Table 479: IPSI state-of-health components

Fault Class	Circuit pack function that is monitored	Priority
Clock	Clocking signal for the TDM bus	1 (highest)
PKTINT	Sending and receiving packet control messages	2
EAL	Noting the state of the expansion archangel link (up or down)	3
Generation	Generating tones	4 (lowest)

TN2312AP IP Server Interface (IPSI)

Figure 85: TN2312AP IPSI



The IPSI circuit pack has the following interfaces:

Control Network Interface

This is a 10/100 BaseT Ethernet interface used to connect to the Control network. This interface is available through the backplane I/O as well as through the faceplate. When the IPSI I/O adapter is plugged onto the Amphenol connector, located on the rear of the carrier, the backplane connections will be selected, otherwise, connectivity to the faceplate will be selected. For the PN control carriers, the backplane connections are available only when the new PN control carriers are used.

Services Interface

This is a 10/100 BaseT Ethernet interface accessible from the faceplate for services personnel to configure the IPSI firmware (IP address settings), access the SAT, and to debug the control network connectivity (ping, traceroute, etc.).

PN's Maintenance Board Interface (TN2312AP)

This interface consists of RS232 transmit and receive leads and reset leads that connect to the PN's TN775D Maintenance board via the faceplate or the backplane. Communication Manager talks to the Maintenance board via the IPSI's archangel through this interface for cabinet maintenance (cabinet temperature, voltage, emergency transfer and etc.). This interface also allows the Maintenance board to reset the IPSI board when it detects insanity of the IPSI's archangel. When the ribbon cables are connected between the IPSIs and the PN's TN775D Maintenance board, the faceplate connections are selected, otherwise the backplane connections are used. The backplane connections are available only when the new backplane is used. This connection will not support the RS-232 SAT connection via the PN's Maintenance board.

Environmental maintenance (TN2312BP)

The TN2312BP IP Server Interface (IPSI) provides environmental maintenance and is the only IP server interface that is supported in the G650. A TN2312BP can only be placed in a G650 with a carrier address set to A or B. Only a TN2312BP in a G650 with a carrier address set to A provides environmental maintenance. The TN2312BP is backward compatible with the TN2312AP, but provides environmental maintenance only when used in a G650. The TN2312BP always provides tone detection, call classification, tone generation, and clock functions.

When the TN2312BP is used in an MCC1or SCC1, a TN775D provides the environmental maintenance.

The TN2312BP provides environmental maintenance for the G650. This includes:

- External device alarm detection
- Emergency transfer control
- Customer-provided alarm device control

The TN2312BP and the 655A power supply provide the following information to the G650:

- **Environment maintenance**
  - Inlet temperature - Inlet temperature of the G650 (sensor is in the 655A power supply)
  - Exhaust temperature - G650 carrier exhaust air sensor
  - Hot Spot temperature status- 655A power supply sensor
  - Voltage
    - +5VDC
    - -5VDC
    - -48VDC
  - Fan Control - The speed at which the fans are operating:
    - Undr indicates that the fan voltage is under 12VDC.
    - Mid (normal) indicates that the fan voltage is +12VDC.

  - High indicates that the fan voltage is +14VDC.
  - Over indicates that the fan voltage is above 14 to 15VDC.
- Fan Alarm - Detection of a blocked or failed fan
- Ring Status - OK, overload, shorted, or failed
- Ring Control - Active, standby, disabled, off (shorted or failed)
- Ringer Setting - 20Hz, 25Hz, or other
- Ring Detection - Reports if the power supply detects ring on the backplane ring leads
- Input Power - Indicates the type of power present and in use, AC or DC

- **External device alarm detection**

  The external device alarm detection uses two external leads. External devices such as an uninterruptible power supply (UPS) or voice messaging system can use these leads to generate alarms using the Avaya Communication Manager alarm reporting capability. Ground potential on either of these leads results in an alarm being generated. You can administer the alarm level (major, minor, or warning), product ID, alternate name, and alarm description for each lead.

- **Emergency transfer control**

  Emergency transfer control provides -48VDC to operate an external emergency transfer panel. The Communication Manager controls the state of the emergency transfer. (Note that, in the past, hardware boards or alarm panels provided a three-position physical switch to control emergency transfer.) An emergency transfer status red LED shows when emergency transfer is active.

  You can use the following Communication Manager SAT commands for emergency transfer:

  - set emergency-transfer on|off|auto - Use this to set emergency transfer to **on** (not in emergency transfer), **off** (in emergency transfer), or **auto** (emergency transfer is controlled by Communication Manager).
  - status cabinet nn - Use this to verify the current setting of emergency transfer.

  When the emergency transfer is set to other than **auto** an alarm is generated.

- **Customer provided alarm device (CPAD) control**

  CPAD provides a contact closure across a pair of external leads that can be used to control a customer-provided alarm device or an alarm indicator. The level of alarm (major, minor, warning, or none) that causes a contact closure can be administered system wide. When the alarm level matches the alarm level that was administered, the TN2312BP closes this contact. When the TN2312BP is in emergency transfer, this contact is closed to activate the CPAD.

- **Tone Detection / Call Classification**

  The TN2312BP provides eight ports of tone detection and call classification. The TN2312AP provides the same functionality.

- **Tone/Clock functions**

  The TN2312BP generates tones and provides clock functions for the port network in which it is placed. (The TN2312AP provides the same functionality.) This functionality is equivalent to the TN2182B Tone/Clock circuit pack.

TDM-Bus Interface

The TDM bus is used by four different functions on the IPSI board:

1. When the Archangel module is activated, it uses the Spitfire2 device to be the bus master of the TDM bus. The Archangel uses this interface to talk to the other port boards' angels on the TDM bus.
2. In angel mode, the Tone-Clock angel uses the Spitfire2 device to talk to an off-board Archangel.
3. The Tone Generator uses the Spitfire2 device to put tones on the TDM bus.
4. The Tone Detector uses the NCE device to receive TDM bus time slots for tone detection.

Packet Bus Interface

When the PKT-INT module is activated, it uses the LANIS device to talk and listen on the packet bus.

System Clock Interface

The Clock module uses the Spitfire2 device to generate clock pulses for the backplane.

IPSI Circuit Pack Faceplate

The faceplate view of the TN2312AP IPSI is shown in Figure 85, TN2312AP IPSI, on page 1115 and described in the following sections.

IPSI LEDs

There are four LEDs on the TN2312AP IPSI faceplate, and five LEDs on the TN2312BP IPSI faceplate. The top three LEDs are the standard ones found on most TN circuit packs. The fourth LED imitates the TN2182B Tone-Clock's amber LED. In addition, the TN2312BP has a fifth LED that shows the emergency transfer control status. The following table describes the IPSI's LED operation.

Table 480: IPSI LEDs

Function	LED	State	Description
Standard circuit pack status	Red	On/Off	TN2312AP circuit pack alarm (controlled by both the PKT-INT and the Tone-Clock Angel; combined by a logical "or")
	Green	On/Off	TN2312AP test in progress (controlled by both the PKT-INT and the Tone-Clock Angel; combined by a logical "or")
	Amber	Off	Archangel inactive
		Flashing 2 sec on 0.2 sec off	Archangel active
Clock status TN2312BP, (same as TN2182B)	Amber	Flashing 2.7 sec on 0.3 sec off	Active: Master clock, using offboard synchronization source.
		Winking 0.3 sec on 2.7 sec off	Active: Master clock, using its local reference source.
		Steady on	Active: Board has been reset and is providing clocks but has not been told which synchronization source to use.
		Steady off	Standby: Applying no tones to the network.
		"Jingle Bells" Green and Amber 0.1 sec on, 0.2 sec off, 0.1 sec on, 0.4 sec off, 0.4 sec on, 0.4 sec off	Standby: Tone generator is being used.
		Double blink Amber 0.3 sec on, 0.3 sec off, 0.3 sec on, 2.4 sec off	Active: Lost all external references and is in holdover mode.
		Random	Standby: This LED may come on and off intermittently as ETR-PTs on the board are used for tone-detection services.
Emergency transfer (TN2312BP)	Red	On	Emergency transfer is active.
		Off	Emergency transfer is inactive.

Push-Button Switch

The push-button switch is used to administer the switch ID and the cabinet number of the IPSI. This button can also be used to erase the manually programmed IP address. Inserting the IPSI board with the button pressed or just resetting it while the button is pressed will keep the IPSI in boot mode.

4-Character LED

The 4-character LED is used to display the circuit pack status related to the Ethernet interfaces. If automatic IP address assignment via DHCP is enabled, the top character displays the Switch ID and the next two characters display the Cabinet Number. The last character is used to display the link status of the two Ethernet interfaces.

Services Interface

The top RJ45 jack is the services interface. This is a 10/100 BaseT Ethernet interface.

Control Network Interface

The bottom RJ45 jack is the control network interface. This is a 10/100 BaseT Ethernet interface. This interface is active only when the IPSI I/O adapter is not plugged onto the Amphenol connector, located on the rear of the carrier.

PN's Maintenance Board Interface

The PN's Maintenance board interface is a header on the IPSI circuit pack with a slit on the faceplate of the IPSI for the ribbon cable to connect to the PN's TN775D Maintenance board.

Error Log Entries and Test to Clear Values

Table 481: LIC-ERR Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
18 (a)	0	**busyout ipserver-interface *Uc***	WARNING	OFF	**release ipserver-interface *Uc***

Error Notes:

a **Error Type 18—**This error type is logged when the IPSI circuit pack in question is busied out by maintenance personnel. Make sure the IPSI circuit pack is released from busyout using the **release ipserver-interface *Uc*** command.

System Technician-Demanded Tests: Descriptions and Error Codes

There are no system technician demand tests as such for this MO.

ISDN-PLK (ISDN-PRI Signaling Link Port)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
ISDN-LNK[2]	MINOR	**test port *locationpp* l**	ISDN-PRI Signaling Link port
ISDN-LNK	WARNING	**test port *locationpp* sh**	ISDN-PRI Signaling Link port

1 For information on specifying a ***location***, see Command Syntax on page 179. Note that for this MO, pp is **24** for 24-channel interfaces and **16** for 32-channel interfaces.

2 For additional related information, see UDS1-BD (UDS1 Interface Circuit Pack) on page 1950.

NOTE:
This MO was formerly known as "ISDN-LNK (ISDN-PRI Signaling Link Port)".

NOTE:
See the figures in the ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 section of this chapter for an illustration of the principles described below.

The ISDN-PRI interface uses out-of-band signaling (as opposed to robbed-bit, in-band signaling) to transmit control messages between two endpoints. User information channels carry digitized voice and digital data and are known as bearer channels (B channels). B channels are assigned to DS1 ISDN trunks or PRI endpoints. Call-control signaling for the B channels is combined and carried over the separate ISDN-PRI Signaling Link Port D channel.

The ISDN-PRI Signaling Link Port (ISDN-LNK) is a port on a TN464C/D (**S8100**: TN464F/GP) UDS1 Interface circuit pack that has a direct interface to the packet bus that carries D-channel messages to the processor. The associated B channels can use ports on the same circuit pack or ports on other TN464C/D (**S8100**: TN464F/GP) or TN767 DS1 Interface circuit packs. (The TN722 cannot be used for this application). The B channels are connected to the TDM Bus.

NOTE:
S8300 / **G700**: Although the ISDN-PLK MO is provided for a G700 media gateway, this MO only partially supports the G700's MM710 DS1 media module.

Two types of DS1 interfaces exist:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

On 24-channel interfaces, the B channels may use any of the first 23 ports. The signaling link is assigned to the 24th port. On 32-channel interfaces, the DS1 ISDN Trunks (B channels) may use any of ports 1 to 15 and 17 through 31. The signaling link is assigned to the 16th port. The 32nd channel (port 0) is used for framing. In NFAS configurations, the 24th or 16th ports on some of the DS1 circuit packs may be used for B channels. Refer to ISDN-SGR for further information.

S8100

In a 32-channel system, the DS1 ISDN Trunk or PRI endpoint port (B-channels) may use any of the ports 1-15 or 17-31, but the ISDN-PRI Signaling Link Port must be the 16th port on the TN464F/GP circuit pack. In certain configurations (NFAS), the 16th port may be used as a B-channel. Refer to ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 for further details.

The TN767 DS1 interface is used for 24 channel 1.544 Mbps systems. The TN464F/GP can be used for either 24 or 32 channel systems. The 32-channel (31 DS0 channels + 1 framing channel on a 2.048 Mbps link) are only supported on TN464 series circuit packs. A description of these circuit packs appears in DS1-BD or UDS1-BD maintenance documentation.

In a 24-channel system, the DS1 ISDN Trunk or PRI endpoint port (B-channels) may use any of the first 23 ports. The ISDN-PRI Signaling Link Port must be the 24th port. In certain configurations (NFAS), the 24th port may be used as a B-channel. Refer to ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 for further details.

A problem with an ISDN-LNK will affect every associated B channel since, without it, no call-control information can be conveyed to the far-end switch or to a terminal adapter. Stable calls may remain operational, but no new calls can be placed. In turn, the ISDN-LNK depends:

- **S8700** / **S8500** / **S8100**: For systems supporting circuit packs:
  - On the TN464C/D UDS1 Interface circuit pack where it resides
  - On the packet bus that provides the link to the processor
- **S8700** / **S8500** / **S8300**: For systems supporting media modules:
  - On the MM710 Media Module that provides the link to the processor

If there are problems with the ISDN-LNK, also investigate the TN464C/D UDS1 Interface circuit pack (UDS1-BD) and the packet bus (PKT-BUS) for systems supporting circuit packs (**S8700** / **S8500** / **S8100**), or investigate MG-DS1 (MM710 DS1 Interface Media Module) for systems supporting media gateways (**S8700** / **S8500** / **S8300**).

Error Log Entries and Test to Clear Values

Table 482: ISDN-PRI Signaling Link Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp*[2]
18 (a)	0	**busyout port *UUCSSpp*[2]**	WARNING	OFF	**release port *UUCSSpp*[2]**
130 (b)		None	WARNING	ON	**test port *UUCSSpp*[2]**
1537 (c)	46210		WARNING	OFF	
1793 (d)					**test board UUCSS l**
3585 (e)	46222		MINOR	ON	
3841 (f)	46211				

1 of 2

Table 482: ISDN-PRI Signaling Link Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3842 (g)	46223				
3843 (h)		Signaling Port LAN Loop-Back test (#939)			**test port *UUCSSpp*[2] l**

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 pp is **24** for 24-channel interfaces and **16** for 32-channel interfaces.

Error Notes:

Error Type 18: The D channel is demand busied out. No calls can be made over this D channel.

Error Type 130: This Error Type indicates that the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 1537: Link error. This error occurs when the port receives an invalid frame over the D channel. This error normally indicates an off-board problem usually related to transmission errors on the DS1 facility. Execute **list measurements ds1-log** for the UDS1 TN464 circuit pack or MM710 Media Module where the D channel resides. If the UDS1 or MG-DS1 is reporting some errors, then the DS1 facility has experienced transmission problems that could have caused the ISDN-LNK to report a Link Error.

If the UDS1 or MG-DS1 is not reporting errors, execute the long test sequence for the D channel. Investigate any errors. If there are none, execute a long test sequence for the UDS1 circuit pack (UDS1-BD) or MM710 Media Module (MG-DS1). Investigate any errors.

If no errors could be found by testing, the Link Error is probably not affecting service. However, if this Link Error continues to be logged, follow normal escalation procedures.

Error Type 1793: UDS1 Interface circuit pack or MM710 DS1 Interface Media Module is out of service. Look for and resolve UDS1-BD or MG-DS1 errors in the Hardware Error Log.

Error Type 3585: Transmit FIFO Overflow error. This error indicates that the circuit pack is having problems transmitting data to the packet bus, thus affecting the conveyance of signaling information over the D channel. Specifically, this error occurs when the packet-bus transmit buffers overflow. This condition probably indicates a hardware problem.

The actual alarming level will depend on the options chosen via the **set options** command on the G3-MT terminal. ISDN-PRI Signaling Link port alarms are treated as Station alarms, and their default alarming option is to downgrade every alarm to Warning. The value shown in the preceding table indicates the normal, unfiltered case (option "y" on the set options screen).

G700: This error type does not occur on the G700.

Error Type 3841: Bad DLCI error. This error occurs when a LAPD frame is received across the DS1 facility that contains a DLCI that does not have a valid entry in the on-board translation memory. This error normally indicates an off-board problem usually related to a broken endpoint or a state mismatch between a remote endpoint and the local call-processing software. Maintenance will not start any testing or generate any alarms in response to this error.

Error Type 3842: Receive FIFO Overflow error. This error occurs when the circuit pack or media module detects an overflow of its receive buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch between the two endpoints of a packet-switched connection. LAPD should be able to recover from this problem, but it may degrade the performance of the LAN bus. Maintenance will not start any testing or generate any alarms in response to this error.

Error Type 3843: This error occurs when the Signaling Port LAN Loop-Back test (#939) fails. Run the long test sequence and pay particular attention to the results of Test #939.

G700: For this error type, the associated test aborts with Error Code 1412 on the G700.

System Technician-Demanded Tests: Descriptions and Error Codes

The command to test the ISDN-LNK MO is **test port *location pp*** where ***pp*** is 24 for 24-channel interfaces and 16 for 32-channel interfaces.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Port LAN Loop-Back test (#939) **S8300** / **G700**: On the G700, this test aborts with Error Code 1412.		X	D
Signaling Link Board check (#643)	X	X	ND

1 D = Destructive; ND = Nondestructive

Signaling Link Board Check (#643)

This test checks the health of the TN464C/D (**S8100**: TN464F/GP) UDS1 Interface or MM710 DS1 Interface Media Module transporting the ISDN-PRI Signaling Link port.

Table 483: Test #643 Signaling Link Board Check

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this D-channel port is detached from the circuit pack. This is normal when the rollabout video feature is enabled. To complete a test on this port: **1** Re-attach the disconnected PRI terminal adapter. **2** Enter **change ds1 UUCSS** to disable rollabout video on the board, and set the "Alarm when PRI Endpoint Detached" field to **y**.
8	FAIL	The UDS1 TN464C/D (**S8100**: TN464F/GP) circuit pack is not in service. **1** Check the Hardware Error Log for entries logged against UDS1-BD, and consult "UDS1-BD" for repair procedures.

1 of 2

Table 483: Test #643 Signaling Link Board Check *Continued*

Error Code	Test Result	Description / Recommendation
	PASS	The UDS1 Interface circuit pack transporting the ISDN-PRI Signaling Link Port is in service.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy board <address>** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

Signaling Port LAN Loop-Back Test (#939)

This test is **destructive**.

NOTE:
This test aborts with Error Code 1412 on the G700 Media Gateway.

This test verifies the connectivity of an ISDN-PRI signaling port (D channel) across the packet bus, also known as the LAN bus. It will execute only if the port is out of service. Failure of this test indicates a fault associated with the port hardware on the circuit pack.

Table 484: Test #939 Signaling Port LAN Loop back

Error Code	Test Result	Description / Recommendation
1015	ABORT	The port is not in the out-of-service state. Use **busyout port *UUCSSpp*** to place it in the out-of-service state and repeat this test. **CAUTION:** The **busyout** will prevent new call originations on every B channel in the signaling group until the port is released.
1139	ABORT	This port network's packet bus is out of service. **1** Follow repair procedures for the packet bus. **2** Enter **test port *UUCSSpp* long**, and check results of this test (#939).

Table 484: Test #939 Signaling Port LAN Loop back

Error Code	Test Result	Description / Recommendation
1141	ABORT	The Packet Interface circuit pack is out of service. **1** Follow repair procedures for PKT-INT. **2** Enter **test port *UUCSSpp* long**, and check results of this test (#939).
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2012	ABORT	Internal system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Loop-Back Test has failed. **1** If the test fails repeatedly, attempt to reset the circuit pack when the other ports on the board are idle. Reset the circuit pack by entering **busyout board UUCSS** and **reset board UUCSS**. **2** Repeat the test and, if it continues to fail, replace the circuit pack.
	PASS	Connectivity of the D channel over the packet bus is operational.

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ISDN-SGR (ISDN-PRI Signaling Group)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
ISDN-SGR	MINOR	**test signaling-group *grp#***	ISDN-PRI Signaling Group
ISDN-SGR	WARNING	**test signaling-group *grp#***	ISDN-PRI Signaling Group

1 ***grp#*** is the signaling group number (1–166); the test sequence can be either short or long.

An ISDN-PRI Signaling Group is a collection of B channels for which a given ISDN-PRI Signaling Channel Port (D channel) carries signaling information. B channels carry voice or data and can be assigned to DS1 ISDN trunks (ISDN-TRK) or PRI endpoint ports (PE-BCHL).

NOTE:
Throughout this discussion, the term "B channel" refers to an ISDN-TRK or PE-BCHL, depending on the application under investigation.

The following circuit packs/media modules are supported in the implementation of ISDN-PRI.

Circuit Pack/Media Module	Channel Types	Interface
MM710	B and D Channels	24 or 32 channel
TN464C/D	B and D channels	24 or 32 channel
TN767	B channels	24 channel
TN464B	B channels	32 channel (G3r V2 only)
S8100: TN767B or later	B channel with ISDN-PRI D-channel over PI-BD	24-channel
S8100: TN464F/GP	B channel with ISDN-PRI D-channel over PI-BD	24- or 32-channel

The TN464C/D UDS1 Interface circuit pack and MM710 DS1 Interface Media Module, which have a direct interface to the packet bus, are required for D-channel signaling. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

The following discussion describes 24-channel interface signaling groups. The 32-channel interface works the same way, except that only port number 16 is used for signaling instead of port number 24. Ports 1 through 15 and 17 through 31 are used for B channels. The 32nd channel (port 0) is always used for framing.

ISDN-PRI D-channel signaling can be combined with a group of B channels in three basic ways:

- FAS (facility-associated signaling)
- NFAS (nonfacility-associated signaling)
- Backup NFAS signaling

In a FAS signaling group, the 24th port of the TN464C/D UDS1 Interface circuit pack or MM710 DS1 Interface Media Module carries D-channel signaling for up to 23 B-channel ports on the same circuit pack or media module.

S8100

In an FAS Signaling Group, the 24th port of the DS1 Interface circuit pack (for 24 channel interfaces) or the 16th port of the DS1 Interface circuit pack (for 32 channel interfaces) is always the D-channel that carries signaling information for the other ports (B-channels) on the circuit pack. If a Packet Control circuit pack is used then only the TN464F/GP circuit pack may be used.

In an NFAS signaling group, the 24th port of one TN464C/D UDS1 Interface or MM710 DS1 Interface Media Module can carry D-channel signaling for B channels on several other DS1 circuit packs or DS1 Media Modules, as well, including TN767s and TN464Bs. The 24th port on the other circuit packs or media modules can be used as a B channel. A D channel in an NFAS group can signal for B channels on a total of 20 DS1 circuit packs or media modules.

S8100

In an NFAS Signaling Group, the 24th port of a DS1 Interface circuit pack (for 24 channel interfaces) or the 16th port of a DS1 Interface circuit pack (for 32 channel interfaces) is administered as a D-channel. The D-channel carries signaling information for the other ports (B-channels) on that circuit pack. That D-channel can also carry signaling information for any of the ports on other DS1 Interface circuit packs in the NFAS Signaling Group. As a result, the 24th port on other 24-channel DS1 Interface circuit packs and the 16th port on other 32-channel DS1 Interface circuit packs can be used as B-channels. A D-channel in an NFAS Group can signal for B-channels on a total of 20 DS1 Interface circuit packs. This configuration is known as NFAS Simplex.

D-channel backup provides increased reliability, which is highly desirable since NFAS permits a D channel to signal for many more B channels. NFAS allows the administration of a backup D channel that remains in a standby state until the active D channel goes down. If so, the backup D Channel takes over and provides signaling for every B channel in the signaling group.

The operation of the entire ISDN-PRI signaling group depends on several other entities:

- **S8700** / **S8500** / **S8300**: The ISDN-PRI signaling channel ports, the TN464C/D UDS1 Interface circuit pack or MM710 DS1 Interface Media Module, on which the D channels reside, and the system link that is carried over the packet bus to the processor.
- **S8100**: The DS1 Interface circuit pack on which the D-channel(s) resides, the ISDN-PRI Signaling Link Port(s), and the Processor Interface Link that provides connectivity to the processor.

When there are problems with the ISDN-PRI signaling group, also investigate ISDN-PLK (ISDN-PRI Signaling Link Port) on page 1121, UDS1-BD (UDS1 Interface Circuit Pack) on page 1950, MG-DS1 (DS1 Interface Media Module) on page 1255, SYS-LINK (System Links) on page 1782, and PKT-BUS (Packet Bus - S8100) on page 1414, as appropriate.

Error Log Entries and Test to Clear Values

Table 485: ISDN-PRI Signaling Group Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any		**test signaling-group** <***grp#***>
1 *	Any	None			
257 *	Any	None			**test signaling-group** <***grp#***>
513 *	Any	None			**test signaling-group** <***grp#***>
769	Any	Primary Signaling Link Hardware Check (#636)			**test signaling-group** <***grp#***>
1025	Any	Secondary Signaling Link Hardware Check (#639)			**test signaling-group** <***grp#***>
1793 *	Any	Layer 2 Status Test (#647)	WARNING	OFF	**test signaling-group** <***grp#***>
2049 *	Any	Layer 2 Status Test (#647)	WARNING	OFF	**test signaling-group** <***grp#***>
2305 *	Any	Remote Layer 3 Query Test (#637)	MINOR	OFF	**test signaling-group** <***grp#***>
3585 *	Port number	None			
3842 – 3942 *	Port number	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Additional Information:

Error Type 1: This switch sent a message to the far-end switch or terminal adapter, and the far end did not respond in the allotted time. Possible causes include link failure and congestion or outage at the far end. The Aux Data field contains layer-3 protocol information used by internal counters.

If no other symptoms are present, no action is required. If layer-3 communication is down, there should be indications in the screen of alarms and errors for link components. Check for other errors against ISDN-SGR, ISDN-TRK, and other hardware components on the link.

There is no test to clear these errors. The error counter is decremented by 1 every 15 minutes.

Error Type 257: This error indicates that the primary signaling channel connection has been lost for more than 90 seconds. If a secondary signaling channel does not exist or is not in service, the associated B channels will be placed in the ISDN Maintenance/Far-End state. The B channels will not be usable for outgoing calls, although incoming calls will still be accepted. The switch will automatically attempt to recover the signaling link. Pay particular attention to the results of

Test #636 (Primary Signaling Link Hardware Check) in the test sequence. When the link does recover, the B channels will be negotiated back to the In-Service state and their alarms will be retired.

When this error occurs, the state of the Signaling Group is changed to out of service (verify using the **status signaling-group <grp#>** command).

Error Type 513: This error indicates that the secondary signaling channel connection has been lost for more than 90 seconds. If the primary signaling channel is not in service, B channels will be placed in the ISDN Maintenance/Far-End state. The B channels will not be usable for outgoing calls, although incoming calls will still be accepted. The switch will automatically attempt to recover the signaling link. Pay particular attention to the results of Test #639 (Secondary Signaling Link Hardware Check) in the test sequence. When the link does recover, the B channels will be negotiated back to the In-Service state and their alarms will be retired.

When this error occurs, the state of the Signaling Group is changed to out of service (verify using **status signaling-group <grp#>**).

Error Type 1793: This error indicates a failure of the Layer 2 Query Test for the primary signaling channel.

Error Type 2049: This error indicates a failure of the Layer 2 Query Test for the secondary signaling channel.

Error Type 2305: This error indicates a failure of the Remote Layer 3 Query test (#637). A specific message was sent to the far-end switch, and it did not respond within the allotted time. Investigate elements of the ISDN PRI D channel(s) (ISDN-LNK) for both this switch and the far-end switch. If Test #637 fails twice in a row, the B channels will be alarmed and made unavailable for outgoing calls (although incoming calls will still be accepted). When Test #637 succeeds and the far-end switch starts responding properly, the DS1 ISDN Trunk (B channels) will be placed back into normal operation, and their alarms will be retired.

Error Type 3585: A SERV or SERV ACK ISDN D-channel message has been received by a non-US-type interface (country option other than `1` on the DS1 Administration screen). However, these messages are used only for NFAS D-channel backup signaling that is supported only by country protocol 1.

Thus, there may be a mismatch in administration between the local and far-end switches. Consult with the customer's network provider to determine whether the D channel is set up correctly at the far-end switch.

Error Types 3842 - 3942: These Error Types are used to report certain error messages received by the ISDN-PRI Signaling Group for one of its associated B channels. The aux data field shows for which B channel (port number) the message was received.

The error code generated equals 3840+*x*, where "*x*" is a cause value defined by the ISDN-PRI Specification. Note that there is no Test to Clear Value for these Error Types; selected ISDN cause values are placed in the log when they are received, but no direct action or alarming is performed solely in response to receiving them. They provide added data that may prove useful when tracking down obscure networking and routing problems. Table 486 provides more information:

Table 486: Descriptions and Recommendations for Error Types 3842-3942

Error Code	Description	Recommendation
3842	A request has been made to use a transit network or common carrier that cannot be accessed.	**1** From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. **2** Check every routing pattern containing this trunk group for validity of interexchange carriers requested (IXC field).
3843	No route to destination. Request received to route call through a transit network that is recognized but not allowed to carry the call or not able to serve the destination.	
3846	The far-end switch has indicated that the B channel (trunk) is not acceptable for use in the call for which it was requested.	This could indicate an administration problem (for example, the local switch and the far-end switch have different B channels administered), or could reflect the occurrence of a normal race condition (for example, the local switch has requested use of a B channel that the far-end switch had just reserved for use on another call). **1** From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. **2** Issue **status trunk** for the indicated trunk. Refer to the "DS1 ISDN Trunk Service States" and "ISDN-PRI Trunk Service States" sections of ISDN-TRK for recovery suggestions.
3858	Similar to Error Type 1. The switch sent an ISDN message to the far-end switch or terminal adapter that did not respond in the allotted time.	Follow same recommendations as for Error Type 1.
3878	The far-end switch has indicated that the network is not functioning correctly and that the condition may last a relatively long period of time (for example, immediately re-attempting the call may not be successful).	**1** From the circuit pack or media module and port number (in the Aux Data field, determine the trunk group against which the error was reported. **2** Consult with the network provider to determine the nature and expected duration of the out of service condition. **3** Consider modifying every routing pattern containing this trunk group to route calls around the network that is out of service.

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Table 486: Descriptions and Recommendations for Error Types 3842-3942

Error Code	Description	Recommendation
3890	A request to use a network service (e.g., SDN) has been denied. Administration somewhere on the network has indicated that the requested service has not been subscribed to or purchased for this trunk.	This could be a local administration problem only, or a mismatch between the local administration and that of the network provider. **1** From the circuit pack or media module and port number (in the Aux Data field), determine the trunk group against which the error was reported. **2** Display the trunk group form: If the trunk group is Call-by-Call (Service Type is “cbc”), check every routing pattern form containing this trunk group to see if the Service/Feature fields contain the correct network services purchased for this trunk. If the trunk group is not Call-by-Call, check that the Service Type field contains the single network service purchased for this trunk. **3** If local administration appears correct, consult with the customer and/or the network provider to determine the services that the customer has subscribed to for this trunk group.
3892	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3894	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	First, eliminate any transitory state mismatch problems by issuing **test port <*address*>** for the trunk port shown in the Aux Data field. Test #256 (Service State Audit) is the important test in the sequence. If this passes satisfactorily, yet the customer continues to complain of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information. **Note:** For details on command addresses, see Command Syntax on page 179.
3902	FRANCE ONLY: Service not authorized.	
3903	Service or option not available, unspecified. This cause is used to report a “service or option not available” event only when no other cause in the “service or option not available” class applies.	

Table 486: Descriptions and Recommendations for Error Types 3842-3942

Error Code	Description	Recommendation
3905	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate the problem and provide the next tier with this Error Log information.
3906	Protocol detail; may offer a clue if customer is having ISDN calls denied with an unexpected intercept tone.	If customer is complaining of unexpected intercept tones when accessing ISDN trunks or PRI endpoints and no other cause can be found, escalate to the problem and provide the next tier with this Error Log information.
3909	A request to use a network service has been made, but the network has rejected the request because the requested service is not implemented.	Follow the previous recommendation for Error Type 3890.
3910	Only restricted digital BC available.	
3919	Service or option not implemented, unspecified. Used when no other cause in this class applies.	
3928	A call was denied because of a basic incompatibility existed between the type of call and either the facilities selected by the routing pattern or the called user.	This error might be helpful as a clue if the customer complains of receiving unexpected intercept tone after accessing ISDN trunks or PRI endpoints. Determine the trunk group from the circuit pack or media module and port number (in the Aux Data field) and then check the BCC fields of the pertinent routing patterns. Also, investigate whether or not the calling and called endpoints are compatible (for example, some ISDN switches may not allow a voice station to call a data extension).
3942	Timer expiry: T310 time-out, no answer to CALL PROCEEDING.	

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System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the *Primary Signaling Link Hardware* check (#636), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Primary Signaling Link Hardware check (#636)	X	X	ND
Secondary Signaling Link Hardware check (#639)	X	X	ND
Layer 2 Status test (#647)	X	X	ND
Remote Layer 3 Query test (#637)	X	X	ND

1 D = Destructive; ND = Nondestructive

Primary Signaling Link Hardware Check (#636)

The ISDN-PRI Signaling Group D-channel port depends on the health of the TN464C/D UDS1 Interface circuit pack (**S8100**: DS1/UDS1 circuit pack) or MM710 DS1 Interface Media Module on which it resides. This test will fail if there are problems with either the ISDN-PRI Primary D-channel port or the UDS1 circuit pack (**S8100**: DS1/UDS1 circuit pack) or MM710 DS1 Media Module. If there are problems with the ISDN-PRI Primary Signaling Channel port (ISDN-LNK), also investigate the UDS1 circuit pack (UDS1-BD), (**S8100**: DS1/UDS1 circuit pack), or MM710 Media Module (MG-DS1).

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with the primary D-channel port is detached from the circuit pack or media module. This is a normal abort when the rollabout video feature is enabled. To complete test on this port, either: **1** Re-attach the disconnected PRI terminal adapter, **or** **2** Enter **change ds1 <address>** to disable rollabout video on the board, and set the "Alarm when PRI Endpoint Detached" field to **y.**
8	FAIL	There is a problem with the UDS1 TN464C/D circuit pack, (**S8100**: DS1/UDS1 circuit pack) or the MM710 DS1 Interface Media Module, or the ISDN-PRI Signaling Channel (D channel). No ISDN trunk or PRI endpoint calls can be made until the problem is resolved. **1** Consult the procedures for the UDS1 TN464C/D circuit pack (UDS1-BD), (**S8100**: DS1/UDS1 circuit pack), or the MM710 DS1 Interface Media Module (MG-DS1), and the ISDN-PRI Signaling Channel (ISDN-LNK).
	PASS	The basic physical connectivity of the primary D channel is intact and functional. One might try this test repeatedly to ensure the link is up and to uncover any transitory problems.

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Error Code	Test Result	Description / Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the circuit pack or media module interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy <address> board** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

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Remote Layer 3 Query (#637)

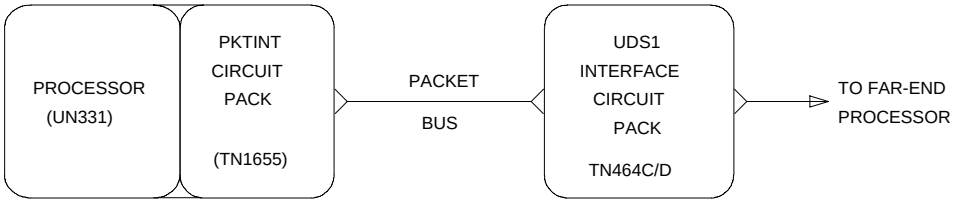
This test will query the far-end switch or terminal adapter to determine whether the signaling connection is functioning properly at Layer 3. It will select a B channel in the in-service or maintenance service state and send an ISDN layer-3 SERVice message, which requires a response from the far end (similar to performing Test #256 on an ISDN trunk. The test will not be performed if there are no B channels in an appropriate ISDN service state (as when none are administered or they are all out of service).

> **NOTE:**
> The service state can be displayed by using the **status trunk <*trunk-group/trunk-member*>** or **status pri-endpoint** command.

As is the case with Test #256 for an ISDN trunk, a PASS indicates only that a message was composed and sent to the far-end switch or terminal adapter. The ISDN PRI Specification allows up to 2 minutes for a response. Check the Error Log for ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 errors of type 2305 for evidence of a Remote Layer 3 Query failure.

Tests #639 and #636 check the health of the D channels and DS1/UDS1 Interface circuit packs or MM710 DS1 Interface Media Module. As shown in Figure 86, this test goes one step further by checking the communication path from the processor, through the TDM/packet bus and DS1/UDS1 Interface circuit pack, or through the MM710 Media Module, and on to the far-end switch or terminal adapter. A special ISDN message is sent to the far-end switch or terminal adapter, which must respond within a specified amount of time. This test is designed to ensure that the communication path between the switch and the far end is up and operational, and that the two endpoints can properly exchange ISDN control messages.

Figure 86: Remote Layer 3 Query Test (#637)



For systems supporting circuit packs (S8700, S8500, S8100), Figure 86 illustrates a UDS1 Interface circuit pack located in the PN. When the UDS1 board resides in a PN, there is additional PNC hardware connecting the packet buses of the IPSI PN and PN. Examples of such hardware are the Center Stage Switch and fiber-optic cables.

Table 487: Test #637 Remote Layer 3 Query

Error Code	Test Result	Description / Recommendation
S8100: (blank)	ABORT	Internal system error. **1** Retry the command a 1-minute intervals up to 5 times.
1006	ABORT	There are no associated B channels in an ISDN in-service or maintenance service state. **S8100**: For country protocol 1 interfaces (including the USA), either there are no B-channels administered in this signaling group, or all B-channels in this signaling group are either out-of-service or are in a "pending" state (PINS or PMTC, indicating that a B-channel maintenance message for that B-channel has been sent and not yet acknowledged). This is a NORMAL ABORT. **1** Administer or release an ISDN trunk or PRI endpoint before retrying the test. For an ISDN trunk, use **status trunk <*group#/member#*>** to verify the ISDN trunk state. For a PRI endpoint use **status pri-endpoint <*extension*>**. Then, retry this test when at least one B channel is in the in-service or maintenance states. **S8100**: For systems not using country protocol 1 interfaces, there are no B-channels administered in this signaling group.
S8100: 1019	ABORT	There is already a Remote Layer 3 Query in progress. This is a normal ABORT. **1** Wait two minutes, then follow the procedures for when this test passes.
1113	ABORT	The signaling channel is down. Therefore, no messages can be sent to the far-end switch or terminal adapter. **1** Examine the results of Tests #636 and #639 and follow recommendations provided there.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 487: Test #637 Remote Layer 3 Query

Error Code	Test Result	Description / Recommendation
2500 or none	ABORT	Internal system error **or** administration problem **1** Determine whether any B channels are administered. If not, then this is a normal ABORT, since this test cannot run unless at least one B channel is administered. If at least one B channel is administered, there is an internal system error. Retry the command at 1-minute intervals up to 5 times.
S8100: 2500	FAIL	Same as ABORT with no error code. **1** Follow the recommendations for ABORT with no error code.
	FAIL	Internal system error. See description of ABORT with error code 2500.
	PASS	A message was composed and sent to the far-end switch or terminal adapter. The ISDN PRI specification allows up to 2 minutes for a reply. **1** Check the Error Log for ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 for errors of type 2305 for evidence of a Remote Layer 3 Query failure. If no new errors were logged since this test was run, then this switch and the far-end switch or terminal adapter can exchange call control messages. **2** If there is still a problem with a particular ISDN trunk or PRI endpoint, busyout the trunk and run the long test sequence, paying particular attention to the results of Test #258 (ISDN Test Call).
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the circuit pack or media module interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy <address> board** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

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Secondary Signaling Link Hardware Check (#639)

The ISDN-PRI Signaling Group D-channel port depends on the health of the TN464C/D UDS1 Interface circuit pack (**S8100**: DS1/UDS1 circuit pack) or MM710 DS1 Interface Media Module on which it resides. This test will fail if there are problems with the ISDN-PRI Secondary D-channel port, or the UDS1 circuit pack, (**S8100**: DS1/UDS1 circuit pack), or the MM710 DS1 Media Module. This test will

abort if a Secondary D channel is not administered for the signaling group. If there are problems with the ISDN-PRI Secondary Signaling Channel port (ISDN-LNK), also investigate the UDS1 circuit pack (UDS1-BD), (**S8100**: DS1/UDS1 circuit pack (DS1-BD)), or MM710 DS1 Media Module (MG-DS1).

Table 488: Test #639 Secondary Signaling Link Hardware Check

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1132	ABORT	The Secondary D channel is not administered for this Signaling Group. This is a NORMAL ABORT. Only a Primary D channel must be administered for a Signaling Group.
S8100: 4	FAIL	There is a problem with the Processor Interface Link. No DS1 ISDN Trunk (B-channel) or Wideband PRI Endpoint calls can be made until the problem is resolved. **1** Display the Communication-Interface Links Form via the **display communication-interface** command to determine which link is down (find the one that matches the DS1 Interface circuit pack on which this ISDN-PRI Signaling Link Port resides) and then refer to PKT-INT (Packet Interface) on page 1421.
8	FAIL	There is a problem with the TN464C/D UDS1 Interface circuit pack (**S8100**: DS1/UDS1 circuit pack), or the MM710 DS1 Interface Media Module, or the ISDN-PRI Secondary Signaling Channel (D channel). No ISDN trunk or PRI endpoint calls can be made until the problem is resolved. **1** Consult the procedures for the UDS1 TN464C/D circuit pack (UDS1-BD), (**S8100**: DS1/UDS1 circuit pack (DS1-BD)), or the MM710 DS1 Interface Media Module (MG-DS1), and the ISDN-PRI Signaling Channel (ISDN-LNK).
	PASS	The basic physical connectivity of the Signaling Group's Secondary D channel is intact and functional. Try this test repeatedly to ensure the link is up and to uncover any transitory problems.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the circuit pack or media module interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy <address> board** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

Layer 2 Status Test (#647)

The Layer 2 Status Test checks the layer-2 status of the ISDN-PRI Signaling Channel (D channel). This test will fail if there is a hardware failure or a facility problem, or if the primary and secondary ISDN-PRI D channels are not administered correctly.

The Primary and Secondary Signaling Link Hardware tests (test 637 and 639) and the Remote Layer 3 Query test (#637) will detect most problems caused by hardware failures or incorrect administration. However, this layer-3 test cannot detect end-to-end transmission problems with the standby D channel since layer-3 messages are not sent on the standby channel.

For systems supporting circuit packs, the SYS-LINK MO reports layer-2 ISDN-PRI D-channel problems and the PI-LINK MO reports layer-2 ISDN-PRI D-channel problems (if the D channel is connected to the Processor Interface circuit pack). However, for some systems, the PI-LINK (**S8100**: PKT-INT) MO does not monitor the layer-2 status of the ISDN-PRI D channel, when it is connected to the Packet Control circuit pack for the ISDN-PRI over PACCON feature.

The Layer 2 Query test is provided to detect Layer-2 D-Channel failures and generate an associated Warning alarm independent of the hardware configuration used for the D channels.

Table 489: Test #647 Layer 2 Status Query Test

Error Code	Test Result	Description / Recommendation
1132	ABORT	Internal system error: The port location for the primary ISDN-PRI D channel is not known. This condition should not be possible since an administered DS1 circuit pack or media module must be specified when a Signaling Group is administered: **1** Retry the command at 1-minute intervals up to 5 times.
1134	ABORT	Internal system error: The associated DS1 circuit pack or media module is not administered. This condition should not be possible since an administered DS1 circuit pack or media module must be specified when a Signaling Group is administered. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error: **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	Layer 2 of the primary signaling channel is down: **1** Examine the results of the Primary Signaling test (#636), and follow recommendations provided there. **2** If Test #636 passes, the Layer 2 Query test may still fail if the Signaling Channel at the far end has not been administered correctly or if the Signaling Channel has been busied out. Verify that the Primary Signaling Channel (D channel) at the far end has been administered correctly. Verify that the DS1 port used for the Primary D channel has not been busied out at the far end.

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Table 489: Test #647 Layer 2 Status Query Test

Error Code	Test Result	Description / Recommendation
2	FAIL	Layer 2 of the secondary signaling channel is down. **1** Examine the results of Secondary Signaling Link Hardware test (#639), and follow recommendations provided there. **2** If tests #639 passes, the Layer 2 Query test may still fail if the Signaling Channel at the far end has not been administered correctly or if the Signaling Channel has been busied out. Verify that the Secondary Signaling Channel (D channel) at the far end has been administered correctly. Verify that the DS1 port used for the Secondary D channel has not been busied out at the far end.
3	FAIL	Both the primary and secondary are down. **1** Examine the results of the Primary and Secondary Signaling Link Hardware Tests (#636 and #639) and follow recommendations provided there. **2** If tests #636 and #639 pass, the Layer 2 Query test may still fail if the Signaling Channel at the far end has not been administered correctly or if the Signaling Channel has been busied out. Verify that the Primary and Secondary Signaling Channel (D channel) at the far end has been administered correctly. Verify that the DS1 port used for the Primary and Secondary D-channels has not been busied out at the far end.
	PASS	The Primary Signaling Channel is up and, if administered the Secondary Channel is up.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the circuit pack or media module interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy <address> board** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

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ISDN-TRK (DS1 ISDN Trunk)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
ISDN-TRK[2]	MAJOR[3]	**test port *location* l**	DS1 ISDN Trunk
ISDN-TRK	MINOR	**test port *location* l**	DS1 ISDN Trunk
ISDN-TRK	WARNING	**test port *location* s**	DS1 ISDN Trunk

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 For additional repair information, see also DS1-BD (DS1 Interface Circuit Pack) on page 760 for TN767 ports, UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 for TN464C/D ports, and MG-DS1 (DS1 Interface Media Module) on page 1255 for MM710 Media Module ports.

3 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by the **set options** command.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. See "*Administrator's Guide for Avaya™ Communication Manager, 555-233-506*". The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

NOTE:
See the figures in the ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 maintenance object for an illustration of the principles described below. Throughout this section, the general term DS1 circuit pack refers to TN464 and TN767 series circuit packs for systems supporting circuit packs (S8700, S8500, S8100), and to MM710 DS1 Media Modules for systems supporting media modules (S8300, G700, G350).

A DS1 ISDN trunk is a 64-kbps bearer channel used to transmit digitized voice or data traffic. These trunks, or B channels, use a separate channel, the D channel for call-control signaling. This mode of operation is known as out-of-band signaling, as opposed to in-band robbed-bit signaling, in which signaling is carried in the same channel as the voice or data traffic. One D channel, or ISDN signaling link (ISDN-LNK), carries signaling messages for several B channels, forming an ISDN signaling group (ISDN-SGR).

A B channel may be a port on a TN464 series UDS1 circuit pack, a TN767 series DS1 Interface circuit pack, or an MM710 DS1 Interface Media Module.

Two types of DS1 interfaces exist:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

On 24-channel interfaces, any of the first 23 ports on the DS1 circuit packs or media modules can be a B channel. On the TN464C/D UDS1 circuit pack or MM710 Media Module, the 24th port may be used as a B channel or as a D channel depending on the type of ISDN-PRI signaling group (FAS or NFAS) implemented on the circuit pack or media module. For more details, see ISDN-SGR (ISDN-PRI Signaling Group) on page 1127. On the TN767 DS1 circuit pack, all 24 ports are used as B channels since D-channel signaling is not supported on the TN767 circuit pack. The signaling for these B channels is done over a D channel located on a UDS1 TN464C/D board.

On 32-channel interfaces, any of ports 1 – 15 and 17 – 31 on the DS1 interface circuit pack or media module can be a B channel. The 16th port may be used as a B channel or as a D channel depending on the type of ISDN-PRI signaling group (FAS or NFAS) to which it belongs. For more details, see ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 and DS1-BD (DS1 Interface Circuit Pack) on page 760 or MG-DS1 (DS1 Interface Media Module) on page 1255.

For interfaces using country protocol 1 on the DS1 circuit pack or media module administration form (including US), the signaling protocol used for the maintenance of the B channel is defined by the Avaya ISDN-PRI specification. For interfaces using country protocols other than 1, the signaling protocol used for the maintenance of the B channel is defined by the CCITT ISDN-PRI Specification.

There are five possible service states for a B channel. The service state is negotiated with the far-end switch, changes over time, and may have far-end and near-end components. The service state is initialized to Out-of-Service/Far-End, and an attempt is made to negotiate it to In-Service.

NOTE:
A system technician can display the service state of a particular DS1 ISDN Trunk B channel by issuing the **status trunk <*trk-group*/*trk-member*>** command.

When a call is present, the specification defines the permissible call states, as well. There are tests in the short and long test sequences for DS1 ISDN Trunk designed to audit these states and ensure agreement between both ends of the PRI connection.

Alarming Based on Service States

A warning alarm is logged against a DS1 ISDN B-channel trunk when it is placed in the Maintenance/Far-End or Out-Of-Service/Far-End states, during which the trunk is unusable for outgoing calls. When a warning alarm is present, use the **status trunk <*group#/member#*>** command to determine the exact state. Other alarms can be diagnosed by using the short and/or long test sequences.

An ISDN B-channel trunk can be placed in a Far-End service state by either action taken by the far-end switch or by failure of the far-end switch to respond. For example, if the far end does not respond to a Remote Layer 3 Query test (#637) for ISDN-SGR, the associated DS1 ISDN trunk B channels will be placed in the Maintenance/Far-End service state.

As a port on a DS1 circuit pack (DS1-BD or UDS1-BD), or a DS1 Media Module (MG-DS1), and as part of a signaling group dependent on a D channel (ISDN-LNK) for signaling, operation of the ISDN-TRK is dependent on the health of these other MOs. In turn, the ISDN D channel depends on the packet bus (PKT-BUS) for transmission through the system. Keep this hierarchy of dependencies in mind when diagnosing problems.

DS1 ISDN Trunk Service States

The **status trunk** command displays the following possible service states for ISDN trunks. Table 490 gives recommended procedures for each state.

- In-Service (INS)

  The B channel is in its normal operating state.

- Out-of-Service/Far-End (OOS/FE)

  A B channel is initialized to this state when administered. The switch sends messages to the far end to negotiate the B channel into service. If the far end does not respond to the messages within a certain time period, then the service state remains out of service and maintenance will periodically resend the messages. The trunk is unusable for incoming and outgoing calls.

  S8100: On US interfaces, the trunk is unusable for incoming calls, but on non-US interfaces, incoming calls will be accepted.

- Out-of-Service/Near-End (OOS/NE)

  This is the state of the trunk when the NPE Crosstalk Test fails or when the trunk is busied out by the system technician. In this state, the trunk is unusable for incoming or outgoing calls. No messages are sent to the far end until the signaling link comes back into service or the trunk is released by the system technician.

- Maintenance/Far-End (MTC/FE)

  This state is reached when the far end does not respond after a certain amount of time to messages sent over the signaling link for a particular trunk . This state is different from OOS/FE since the signaling link must have initially been up and the B channels in service. The switch will periodically send messages to the far end to try to negotiate the trunk (B channel) into service. The trunk is unusable for outgoing calls but will service incoming call requests from the far end. Note that transitions into MTC/FE do not drop stable calls. Therefore, if the service state changes from in service to MTC/FE, then stable calls are unaffected.

- Maintenance/Near-End (MTC/NE)

  The trunk (B channel) is in this state if the signaling channel (ISDN-LNK) is busied out by the system technician. The trunk (B channel) is also temporarily in this state if the system technician issued **test trunk <*trunk-group*/*trunk-member*> long**. This command executes the ISDN-PRI test call. This test changes the state of the trunk member to MTC/NE for the duration of the test unless a call request comes in from the far end. In that case, the test would abort. Note that transitions into MTC/NE do not drop stable calls. In this state, the B channel is not usable for new incoming or outgoing calls.

- Pending States

  In addition to one of the previous components, the service state may have a *pending* component, indicating that the switch is waiting for a reply from the far end. These service states remain in effect until either a response is received or the allotted waiting time expires.

  — Pending-in-Service

  The near end is awaiting a far-end response to a B-channel maintenance message requesting that a B channel be transitioned to in service.

  S8100: The far-end has a certain amount of time to respond to the message. The service state will be PINS until either a response is received or the timer expires.

— Pending-Maintenance

This state is supported only by systems using country protocol 1 (including US). The near end is awaiting a far-end response to a maintenance message requesting that a B channel be transitioned to the maintenance service state. **S8100**: The far-end has a certain amount of time to respond to the message. The service state will be PMTC until either a response is received or the timer expires.

- Call Activity States

  The in-service state also has a call activity component.

  — Active

  A call is connected over the B channel (for example, *in serviceactive*).

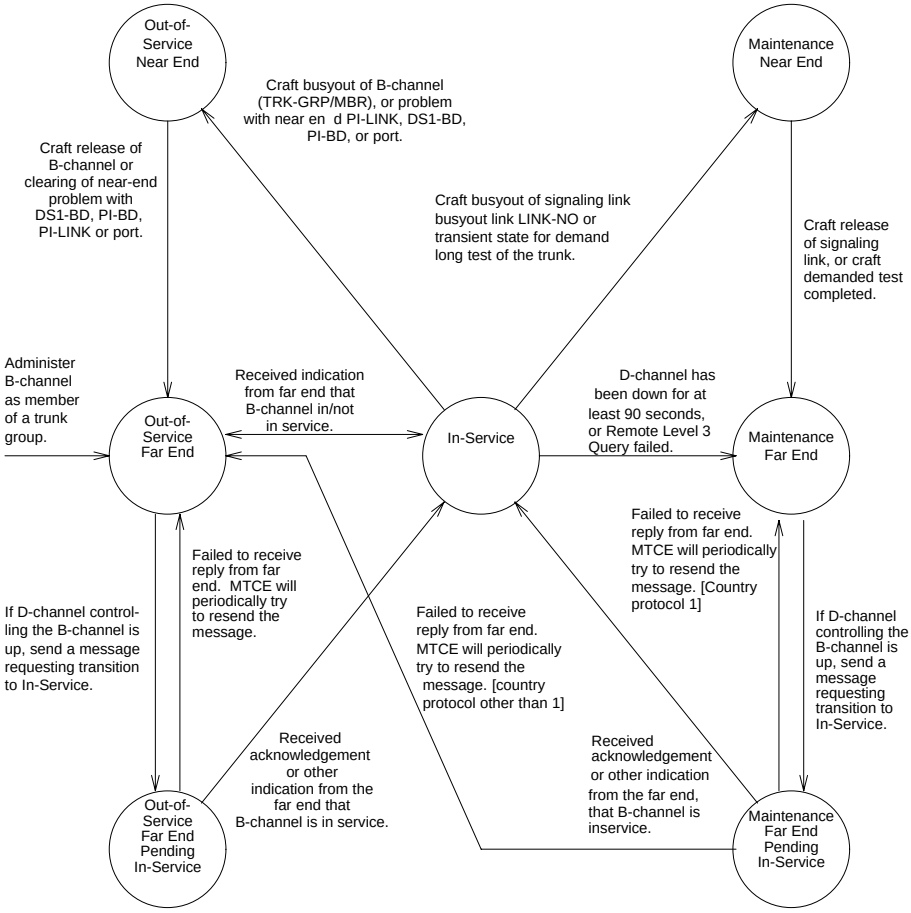
  — Idle

  There is no call currently on the B channel (for example, *in serviceidle*).

S8100

The following diagram of the DS1 ISDN Trunk service states shows the common progression from one service state to another and the event that caused the change of state.

Figure 87: Common Progressions in Service States



ISDN-PRI Trunk Service States

Table 490, Service States, on page 1146 summarizes each of the different DS1 ISDN Trunk service states that can result when the **status trunk <trunk_group/trunk_member>** command is issued.

NOTE:
Refer to Troubleshooting ISDN-PRI in *Maintenance Procedures (555-245-103)* for a layered approach to processing ISDN-PRI problems.

Table 490: Service States

Service State	Alarm[1]	Possible Cause	Possible Solution
out-of-service/NE	Warning	Trunk is demand busied out.	Enter **release trunk <*grp#/mbr#*>**.
	Minor	NPE Crosstalk test (#6) failed.	Replace DS1/UDS1 circuit pack.
	None	DS1 or UDS1 circuit pack or MM710 Media Module lost its signal.	Is the DS1/UDS1 circuit pack, or MM710 Media Module, or cable removed? Is the far-end switch restarting? Check circuit pack or media module using procedures in DS1-BD, UDS1-BD, or MG-DS1.
out-of-service/FE	Warning	Unadministered far end	Administer corresponding trunk on far-end switch.
	Warning	The far-end trunk is busied out.	Check the status of the far-end switch.
pending-in-service, pending-maint	None	Maintenance message was sent and the switch is waiting up to 2 min. for a reply from the far end.	Wait 2 minutes and check service state after the pending state has cleared.
maint/NE	None	ISDN test call in progress (**test trunk long** and **test isdn-testcall** commands)	Wait several minutes for test to finish and check status again.
	None	System link has been busied out by command.	Check link status. Release link with **release link <*lnk#*>**.
maint/FE	Warning	Signaling channel has been down for over 90 sec.	Consult ISDN-SGRP and/or ISDN-LNK. Far-end signaling channel may be busied out, or the far-end switch may currently be restarting.
	Warning	Repeated failure of far end to respond to messages.	Maintenance software will periodically try to resend messages. You can speed the process with **test trunk <*grp#/mbr#* and/or **test signaling-group <*sig-grp#*>**.
	Warning	The far-end trunk is being tested.	Check status of the far-end switch. Wait for testing to finish.
in-service	None	Normal operating state	

1 ISDN-TRK alarms; alarms against other objects may also be present.

Error Log Entries and Test to Clear Values

Table 491: DS1 ISDN Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port <*address*>**
1 *	Any	None			**test port <*address*>**
15 *	Any	Audit and Update Test (#36)			
18	0	**busyout trunk <*grp/mbr*>**			**release trunk <*grp/mbr*>**
19 *	0	None			
129 *		None	WARNING	OFF	**test port <*address*>**
130 *		None	WARNING	ON	**test port <*address*>**
257 *	Any	None			**test port <*address*>**
513 *	Any	None	WARNING	OFF	**test port <*address*>**
769 *	Any	None			**test port <*address*>**
1025 *	0	None			
1281	Any	Conference Circuit Test (#7)	MAJOR MINOR WARNING[2]	ON	**test port <*address*> l r 4**
1537	Any	NPE Crosstalk Test (#6)	MAJOR MINOR WARNING[2]	ON	**test port <*address*> l r 3**
1793 *	Any	None			**test port <*address*>**
3073 *	Any	Service State Audit (#256)			**test port <*address*>**
3585 *	Any	None			**none**
3841 *	Any	None	WARNING	OFF	**None**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Major or minor alarms may be downgraded to Warning alarms based on the value used in the set options command.

Error Additional Information:

Error Type 1: These Error Types indicate a disagreement between this switch and the switch at the other end of the trunk connection with regard to the ISDN call state of the DS1 ISDN Trunk. This switch will automatically try to recover by clearing the call, (that is, call will be torn down). You can use the **status trunk <*group#/member#*>** command to determine the state of the trunk.

When running the short test sequence, pay close attention to the results of the Call State Audit test (#257).

Error Type 15: Software audit error and does not indicate a hardware malfunction. Run the short test sequence, and investigate associated errors.

Error Type 19: Possible protocol mismatch or far end may be out of service.

Error Type 129: The far-end switch changed its ISDN service state to either *out of service* or *maintenance*. This may be either a temporary condition due to far-end testing of that trunk or a hardware problem with the trunk. Outgoing calls will not be allowed over the trunk. To investigate the status of the trunk, issue **status trunk <*group#/member#*>**.

Error Type 130: This Error Type indicates that the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 257: These Error Types indicate a disagreement between this switch and the switch at the other end of the trunk connection with regard to the ISDN service state of the DS1 ISDN Trunk. This switch will automatically try to recover by performing a service state audit. You can use **status trunk <*group#/member#*>** to determine the state of the trunk.

When running the short test sequence, pay close attention to the results of the Service State Audit test (#256).

Error Type 513: This trunk is not recognized by the far-end switch. Investigate the trunk administration for both switches and make changes as necessary.

Error Type 1025: An unexpected SERVICE or SERVICE ACK was received. Possibilities include:

- Translations conflict
- Protocol differences
- ESS may be using NI3 protocol, not currently implemented in Communication Manager.
- B-channel negotiation problem (glare)

Error Type 1793: This error indicates a failure of the DS1/UDS1 Interface circuit pack. When running the short test sequence, the results of the Signaling Link State Check Test (#255) are important.

Error Type 3073: Service State Audit attempt failed (see Test #256). The trunks will not be usable for any outgoing calls (although incoming calls will be accepted) until the test passes and the trunk state is changed to in service (use **status trunk <*group#/member#*>** to investigate trunk status).

Error Type 3585: This error type appears when the switch receives an ISDN RESTART message for an ISDN trunk. Calls are cleared with the RESTART message. Therefore, this error type may be associated with a dropped call report from a user.

The following Aux Data values for **Error Type 3585** represent the trunk's ISDN call state at the time the unexpected request to restart the channel was received from the remote switch. This information can be useful if dropped calls (cutoffs) are reported by users of the ISDN-PRI trunks.

The meanings of Aux Data values are shown below; ignore any others.

Aux Data	Cause
0	A idle trunk received a restart.
10	A call in a stable, talking state was cleared unexpectedly by the far end with an ISDN RESTART message. This state is called the "active" state.
4, 7, 8, 260, 263	A call that has not reached the active state, but has at least reached a ringing state, was cleared unexpectedly by the far end with an ISDN RESTART message.

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Aux Data	Cause
1, 3, 6, 9, 265	A call that has not yet reached a ringing state was cleared unexpectedly by the far end with an ISDN RESTART message.
11, 12, 19, 531, 267, 268	A call that was in the process of clearing anyway has been cleared by the far end with an ISDN RESTART message. If this condition occurs frequently, it may mean that the far end is attempting to clear trunks that it thinks are in a "hung" state. The RESTART message brings the trunk to an idle condition.

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Error Type 3841: An ISDN trunk selected by the near end has been rejected 10 times by the far end without a successful call. This may indicate a service-state mismatch between the near and far ends for this trunk that is affecting the end user (that is, customer receives unexpected intercept tones when accessing ISDN trunks). This may indicate that the ISDN trunk is not administered at the far end.

The Aux field contains the physical name of the ISDN trunk in decimal. Using this decimal name, verify that the far end has this trunk administered.

The Warning alarm will be retired automatically whenever an outgoing or incoming call that uses this trunk is answered by the called endpoint. If problems persist, then busyout the ISDN trunk to take it out of the hunt group.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. For example, by clearing error codes associated with the *NPE Crosstalk* test (#6), you may also clear errors generated from other tests in the testing sequence.

Table 492: System Technician-Demanded Tests: DS1-BD

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8300 / G700:** On the G700/G350, this test aborts with Error Code 1412.		X	ND
Conference Circuit test (#7) **S8300 / G700:** On the G700/G350, this test aborts with Error Code 1412.		X	ND
Audit and Update test (#36)	X	X	ND
Signaling Link State Check test (#255)	X	X	ND
Service State Audit test (#256)	X	X	ND
Call State Audit test (#257)	X	X	ND
ISDN Test Call test (#258) **S8300 / G700:** On the G700/G350, this test aborts with Error Code 1412.		X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk Test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and takes about 20 to 30 seconds to complete.

NOTE:
S8300 / G700: On the G700/G350, this test aborts with Error Code 1412.

NOTE:
The TN464C/D (**S8100**: TN464F/GP) UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.

Table 493: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. **1** Use **status station** or **status trunk** to determine when the port is available for testing. **2** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-Bus errors. **1** If the system has no TDM-Bus errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** or **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Maintenance is disabled on this trunk. **1** Enable maintenance by entering **y** in the Maintenance Tests field on the **change trunk-group** form.

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Table 493: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1117	ABORT	A service state audit message is outstanding. **1** Wait 2 minutes and then try again.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. The ISDN-TRK is moved to out-of-service/near-end state. **1** Replace the circuit pack.
	PASS	The port is able to communicate over the TDM Bus.

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Conference Circuit Test (#7)

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

NOTE:
S8300 / G700: On the G700/G350, this test aborts with Error Code 1412.

NOTE:
The TN464C/D (**S8100**: TN464F/GP) UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.

Table 494: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status station** or **status trunk** to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use status station or status trunk to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Maintenance is disabled on this trunk. **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on of the **change trunk-group** form.
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700/G350 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and examining station, trunk, or external wiring.

Audit and Update Test (#36)

This test sends port level translation data from the switch processor to the DS1 interface circuit pack or media module to assure that the trunk's translation is correct. The port audit operation verifies the consistency of the current state of trunk kept in the DS1 interface circuit pack or media module and in the switch software.

Table 495: Test #36 Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
1018	ABORT	Maintenance is disabled on this trunk. **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on the **change trunk-group** form.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	Test failed due to internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 interface circuit pack or media module and switch software are consistent. **S8100** If the trunk is busied out, the test will not run, but will return PASS. To verify that the trunk is in-service: **1** Enter **status-command** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. **2** Enter **release-trunk** command to put trunk back into in-service. **3** Retry the test command.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy board <address>** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

Signaling Link State Check Test (#255)

The DS1 ISDN Trunk depends on the health of the appropriate TN464C/D UDS1 Interface circuit pack, TN767 DS1 interface circuit pack, or MM710 DS1 Interface Media Module for proper operation. It also depends on the ISDN-PRI D channel (ISDN-LNK) trunk. This test checks the status of those critical elements.

Table 496: Test #255 Signaling Link State Check Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
0	ABORT	
1018	ABORT	Maintenance is disabled on this trunk. **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on the **change trunk-group** form.
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times.
4	FAIL	There is a problem with the signaling channel. **1** **S8100**: If the Packet Control circuit pack is used, consult the procedures for the ISDN-PRI Signaling Group (ISDN-SGRP). Further information may also be obtained by consulting the procedures for the ISDN-PRI Signaling Channel (ISDN-LNK). **2** **S8100**: If the Packet Interface is used, consult the procedures for PKT-INT
8	FAIL	There is a problem with the DS1 interface circuit pack or media module. **1** Consult the procedures for the appropriate DS1 interface circuit pack (DS1-BD or UDS1-BD), or MM710 DS1 Interface Media Module (MG-DS1).
	PASS	The signaling link hardware is OK.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy board <address>** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

Service State Audit (#256)

As noted in the general description for DS1 ISDN Trunk, these trunks may be in one of several service states. This test performs a Service State Audit with the far-end switch.

For interfaces using country protocol 1 (including the US) the Service State Audit executes in every trunk service state. A message is sent to the far-end switch to ensure that both sides agree on the service state. A PASS for this test simply means that the message has been successfully sent. Two minutes are allowed for a reply. If no reply is received within that 2-minute window, the message is sent out again. If that attempt fails, an Error Type 3073 will be logged and the switch will attempt another Service State Audit every 15 minutes. If the trunk was initially in service, it is placed in the maintenance/far-end state. No outgoing calls will be placed over this trunk, but incoming calls will be accepted. If an incoming call is presented with the trunk in such a state, a Service State Audit is immediately attempted (the switch does not wait for the 15-minute cycle, but tries to recover immediately).

For interfaces not using country protocol 1, the Service State Audit executes only if the trunk is in the out-of-service/far-end state. A message is sent to the far-end switch to attempt to bring the trunk back into the in-service state. A PASS for this test simply means that the message has been successfully sent. Two minutes are allowed for a reply. If no reply is received within that 2-minute window, the message is sent out again. If again no response is received within two minutes, the trunk remains in the out-of-service/far-end state. The switch will attempt another Service State Audit after an hour has passed.

To investigate the service state of the DS1 ISDN Trunk, issue the **status trunk** <***group#/member#***> command.

Table 497: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	Resources required to run this test were not available. The port may be on a valid call or initializing. Use **status station** or **status trunk** to determine when the trunk is available for testing. Check the results of Test #255.
1018	ABORT	Maintenance is disabled on this trunk. **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on the **change trunk-group** form.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. **1** Check the results of Test #255 and consult procedures for ISDN-SGR (ISDN-PRI Signaling Group) on page 1127.
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times.
1116	ABORT	The trunk is not in the out-of-service/far-end state that is required to run this test on systems using a country protocol other than 1.
1117	ABORT	A service state audit message is outstanding. **1** Wait 2 minutes and then try again.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 497: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
1113	FAIL	The signaling link has failed; the system cannot send any messages on behalf of this trunk. **1** Consult procedures for ISDN-SGR (ISDN-PRI Signaling Group) and ISDN-LNK (ISDN Signaling Link Port).
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Wait 4 minutes and then check the Error Log for any new errors of type 3073. If there are none, then both sides of the ISDN connection agree on the service state; the negotiation succeeded. If there is a new 3073 error, then the negotiation failed (the far-end switch twice failed to respond within 2 minutes). The switch will automatically retry every 15 minutes. If the trunk was initially in service, it is now placed in the maintenance/far-end state. Incoming calls will be accepted, but no outgoing calls can be originated. If an incoming call is presented, another Service State Audit will be immediately performed in an attempt to put the DS1 ISDN Trunk in the proper state.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy board <address>** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

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Call State Audit Test (#257)

If a call is active on the trunk, the switches on both sides of the connection should agree on the ISDN state of the call, as defined in the ISDN Protocol Specification. This test audits internal call state data by querying the far-end switch as to the ISDN state of the call. It can be helpful when trying to clear a hung call. If the internal call state data on the near-end switch is different than that of the far-end switch, then *the call will be torn down.*

As with Test #256 (Service State Audit), a PASS simply means that an appropriate message was composed and sent to the far-end switch. The ISDN Specification allows up to 2 minutes for a reply. If a reply is not received within the 2-minute window, a protocol time-out violation will be recorded in the error log against the associated signaling channel (ISDN-LNK, Error Type 1).

Table 498: Test #257 Call State Audit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	Maintenance is disabled on this trunk. **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on the **change trunk-group** form.
1019	ABORT	An audit is already in progress. **1** Wait 2 minutes and try again.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. **1** Check the results of Test #255 (Signaling Link State Check).
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times.
1116	ABORT	The trunk is in an out-of-service ISDN service state. **1** A call cannot be present if the trunk is in an ISDN out-of-service state, so a call state audit would be inappropriate. No action necessary. Use the **status trunk <*group#/member#*>** to investigate the ISDN state of the trunk.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	This switch sent a call state auditing message to the far-end switch to verify the state of the call active on this trunk. If a call state mismatch is found, then the call will be torn down within two minutes. If no call was active, then no message was sent.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release busy board <address>** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

ISDN Test Call Test (#258)

NOTE:
S8300 / **G700**: On the G700, this test aborts with Error Code 1412.

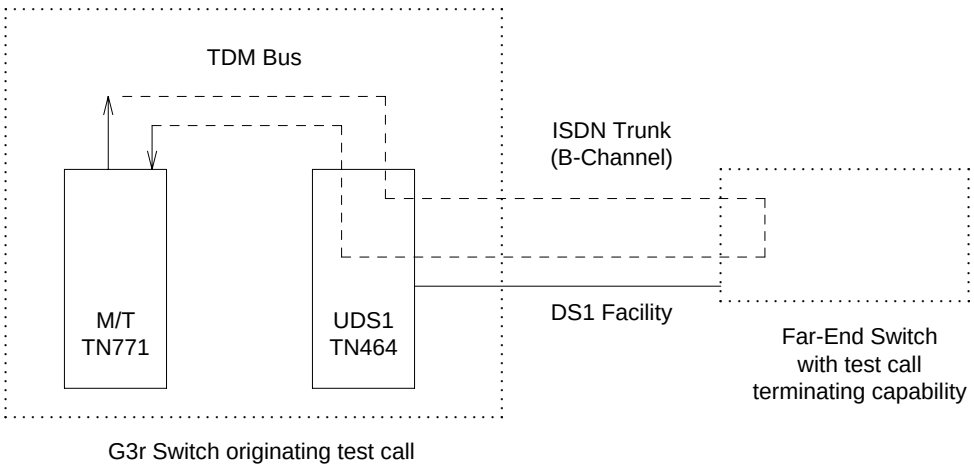
This test performs a far-end loop around to a far-end switch over an ISDN trunk. The trunk's service state must be in service, maint-NE, or out-of-service/NE, and no call can be active on the trunk. The test call can be initiated as part of a long test sequence, or as an individual test, as described below. This test is valid only for systems using country protocol 1 (including US), or when the far end has loop-around capability.

A test call connection is established to a far-end switch over the ISDN trunk to be tested. The digital port on a TN711D Maintenance/Test circuit pack generates a test-pattern bit stream that is sent to the far-end switch and echoed back. The received pattern is then compared to the sent pattern and checked for errors that indicate a loss of integrity on the communications path.

If a test call is running when scheduled maintenance starts, the green LED is turned off. To determine whether a test call is still running:

- Issue **list isdn-testcall** and **status isdn-testcall**.
- Check for a lit amber LED on the Maintenance/Test circuit pack.

Figure 88: Outgoing ISDN-PRI Test Call



S8100

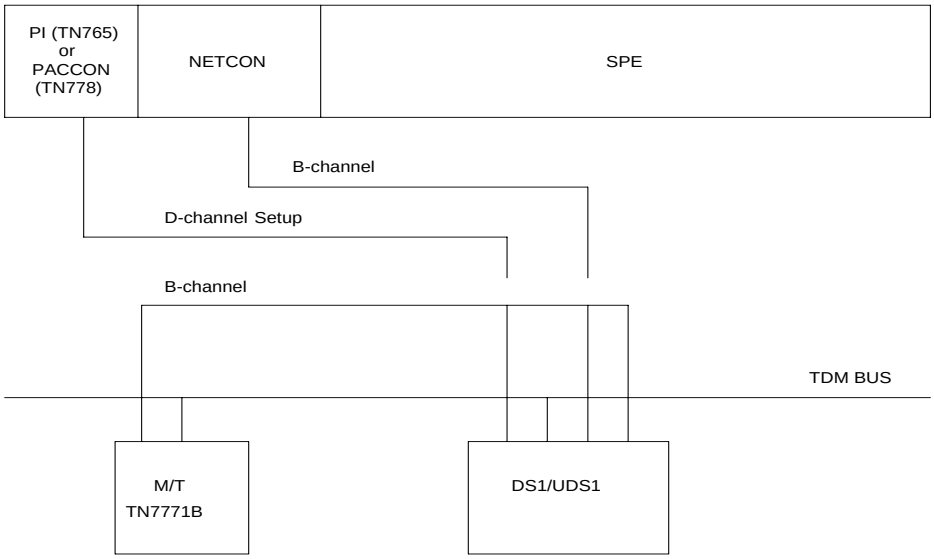
There are two methods available to place an outgoing ISDN-PRI test call.

In the first method, the test call connection is established over the TDM Bus of the transmit and receive sides of the ISDN-PRI trunk to a data channel. This method is selected when no Maintenance/Test circuit pack resides in the system.

In the second method, the test call connection is established over the TDM Bus of the transmit and receive sides of the ISDN-PRI trunk to a digital trunk testing port on the Maintenance/Test circuit pack.

The Maintenance/Test Digital Port generates a pseudo bit stream. A pictorial description of the outgoing ISDN-PRI test call connectivity is contained in Figure 89, ISDN-PRI Outgoing Test Call, on page 1159.

Figure 89: ISDN-PRI Outgoing Test Call



Synchronous Test Calls

Use one of the following commands to initiate a synchronous outgoing test:

- **test trunk <*group#/member#*> long [repeat #]**
- **test board <*address*> long [repeat #]**
- **test port <*address*> long [repeat #]**

The previous test sequences include a test call for ISDN-PRI trunks. The duration of the test call is 8.6 seconds for unrestricted (B8ZS) B channels and 9.4 seconds for restricted (ZCS) B channels. The test fails if the bit error rate retrieved from the Maintenance/Test digital port is greater than 0. When this occurs, you will need to perform further diagnostics, such as **test isdn-testcall** described below.

S8100: If no Maintenance/Test circuit pack exists, the outgoing ISDN-PRI test call is established over a high speed data channel on the Network Control (NETCON) circuit pack (DATA-BD).

Asynchronous Test Calls

You can start, query, and stop an outgoing test call by using the following maintenance commands:

- **test isdn-testcall** <***group#/member#***> [***minutes #***]

  This command initiates an outgoing ISDN-PRI test call up to 120 minutes. Default times are as above. Only one trunk per PN can be tested at one time.

- **status isdn-testcall** <***group#/member#***>

  This command displays the progress of the outgoing test call by reporting bit and block error rates of the tested B channel.

- **clear isdn-testcall** <***group#/member#***>

  This command terminates an outgoing test call already in progress. Measurements already collected are not cleared until the next test call begins.

A PASS of the asynchronous test indicates only that the test call was successfully established. Use **status** and **list** to get the results of the test.

NOTE:
Before attempting to make an ISDN-PRI test call to the public network (that is, the network of the far end), make sure that test call service is provisioned by the network. The user must subscribe to Test Type 108 service and have the correct far-end test call number administered on the trunk group form for the call to be allowed.

Table 499: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
4	ABORT	There is a problem with the Signaling Channel. **1** Consult the procedures for the ISDN-PRI Signaling Group (ISDN-SGRP). Further information may also be obtained by consulting the procedures for the ISDN-PRI Signaling Channel (ISDN-LNK). **S8100**: There is a problem with the Processor Interface Link. Refer to PKT-INT (Packet Interface) on page 1421.
8	ABORT	There is a problem with the DS1 interface circuit pack. **1** Consult the procedures for the appropriate DS1 interface circuit pack (DS1-BD or UDS1-BD).
1004	ABORT	B channel in use. **1** Issue **status trunk <*group#/member#*>** to determine whether a call is active on this DS1 ISDN trunk. **2** When the service state indicates in service/idle, retry the test.
1005	ABORT	Bad Configuration (such as no Maintenance/Test circuit pack) **1** Make sure the Maintenance/Test circuit pack is inserted. **2** Repeat the test.
1018	ABORT	Test call is disabled. **1** Enable Maintenance on the ***Trunk Group*** form.

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Table 499: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
1019	ABORT	Another Test call is in progress. **1** Issue **list isdn-testcall** to locate the test call. **2** Issue **status isdn-testcall** to find out the duration and start time of the test call. **3** Issue **clear isdn-testcall** to stop the test call from running. **4** If time and duration indicate that the test call should have stopped, and **clear isdn-testcall** does not work, seeM/T-DIG (Maintenance/Test Digital Port) on page 1341 for recommended maintenance strategy.
1020	ABORT	There is a problem with the DS1 Interface circuit pack. **1** See DS1-BD (DS1 Interface Circuit Pack) on page 760 or UDS1-BD (UDS1 Interface Circuit Pack) on page 1950.
1024	ABORT	(M/T-DIG) Maintenance/Test Digital Port in use. **1** Wait until yellow and green LEDs are turned off on the M/T-BD (Maintenance/Test circuit pack).M/T-DIG (Maintenance/Test Digital Port) on page 1341 **2** Retry test. If problem persists, seeM/T-DIG (Maintenance/Test Digital Port) on page 1341.
1113	ABORT	The signaling link has failed. Therefore, the system cannot send any messages on behalf of this trunk. **1** Check the results of the Signaling Link State Check test (#255).
1116	ABORT	The switch could not appropriately change the ISDN service state. **1** Issue **status trunk <*group#/member#*>** to determine whether a call is active on this DS1 ISDN trunk. If so, proceed as for Error Code 1119. **2** If not, check the Error and Alarm Logs for problems with this ISDN-TRK (DS1 ISDN Trunk) MO.
1117	ABORT	ISDN Service message is already outstanding. **1** Wait 2 minutes. Then try again.
1118	ABORT	Far end of ISDN trunk is not administered. **1** Check the administration of the far-end ISDN trunk. **2** Issue **status trunk <*group#/member#*>**. **3** Try the test again.
1119	ABORT	The test call was aborted due to a normal call attempt on this trunk. The test call will only be performed if the trunk is idle. **1** Either wait for the normal call to finish normally, or force it to be dropped by using **busyout trunk <*trk-grp/trk-mem*>** to busyout the DS1 ISDN Trunk. When the trunk is idle, retry the test.

Table 499: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
1120	ABORT	The DS1 ISDN Trunk is in the ISDN out-of-service/far-end state. **1** Try to change the service state via Test #256 (Service State Audit Test) and then try this test again. Keep in mind that the trunk may be in the out-of-service/far-end state due to problems at the far-end switch. If that is the case, no remedial action can be taken at this end.
1122	ABORT	There is no test line number for the far-end switch. **1** Check the **Trunk Group** administration form.
1123	ABORT	There is no Feature Access Code administration for this Facility Test. **1** Check the **Dial Plan and Feature** administration forms.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000, 2012, None	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2035	ABORT	The call has timed out, perhaps because of a lack of system resources. **1** Wait 1 minute and try again.
2036, 2037	ABORT	Internal system error. **1** Follow recommendation for ABORT code 2012.
2038, 2039	ABORT	A problem occurred while trying to read the test data. **1** Wait 1 minute and then try again. If the test aborts again in the same manner, there is a serious internal problem.
2040	ABORT	Internal system error. Follow recommendations for ABORT code 2012.
2041	ABORT	The call has timed out, perhaps because of a lack of system resources. Follow recommendations for ABORT code 2035.
2066	ABORT	Could not establish test call. **1** Retry the command at 1-minute intervals up to 5 times.
2067	ABORT	The call has timed out, perhaps because of a lack of system resources. Follow recommendations for ABORT code 2035.
2074	ABORT	Bit and Block Error query failed. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, there may be a serious internal problem with M/T-DIG (Maintenance/Test Digital Port). If this is the case, seeM/T-DIG (Maintenance/Test Digital Port) on page 1341.
2075	ABORT	Internal system error. Follow recommendations for ABORT code 2012.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

Table 499: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
2104	ABORT	Call dropped or could not be originated. **1** Make sure service is provisioned by the network. **2** Check the administration of the far-end test line extension on the **Trunk Group Administration** form. **3** Check the administration of the Testcall BCC (Bearer Capability Class) on the **Trunk Group Administration** form. **4** Check the reason for termination with **status isdn-testcall**. **5** For further instructions see Troubleshooting ISDN-PRI test calls in *Maintenance Procedures (555-245-103)*. **6** Try the test again.
2201, 2202, 2203, 2204, 2205	ABORT	Internal system error. Follow recommendations for ABORT code 2012.
2206	ABORT	Could not allocate the necessary system resources to run this test. Follow recommendations for ABORT code 2100.
2208	ABORT	Internal system error. Follow recommendations for ABORT code 2012.
2209, 2210	ABORT	Could not allocate the necessary system resources to run this test. Follow recommendations for ABORT code 2100.
2211	ABORT	Internal system error. Follow recommendations for ABORT code 2012.
2212	ABORT	Call ended by unexpected disconnect. **1** Wait 1 minute, and then try again.
2213	ABORT	The call has timed-out, perhaps because of a lack of system resources. Follow recommendations for ABORT code 2035.
2214	ABORT	Call ended by unexpected disconnect. **1** Wait 1 minute, and then try again.
2215, 2216, 2217, 2218, 2219	ABORT	Internal system error. Follow recommendations for ABORT code 2012.
2220	ABORT	Call ended prematurely. **1** Wait 1 minute, and then try again.
2221, 2222, 2223, 2224, 2225, 2226	ABORT	Internal system error. Follow recommendations for ABORT code 2012.

Table 499: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
2227	ABORT	Could not allocate the necessary system resources to run this test. Follow recommendations for ABORT code 2100.
2042	FAIL	Comparison of data sent to data received indicates a loss of integrity on the communications path. **1** Take the trunk out of service and check the quality of the DS1 connection, including the transmission facility and any external equipment such as DACs, CSUs, etc. Use **test isdn-testcall** and **status isdn-testcall** commands to get the bit and block error rates.
	PASS	The test pattern was sent and received properly. If the synchronous test call was performed (long test sequence), this indicates that the communications path is operating properly. If **test isdn-testcall** was used, PASS indicates only that the test call was established. Use **status isdn-testcall** to get the bit and block error rates detected by the test. If the bit and block error rates are not acceptable, perform a complete analysis of the DS1 facility including the transmission facility and any external equipment such as DACs, CSUs, etc.

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JNL-PRNT (Journal Printer Link)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
JNL-PRNT	MINOR	**test journal wakeup-log**	Journal Printer Link
JNL-PRNT	WARNING	**test journal wakeup-log**	Journal Printer Link

The maintenance strategies for JNL-PRNT (Journal Printer Link) and PMS-PRNT (PMS Printer Link) are the same. Refer to the "PMS-PRNT/JNL-PRNT (PMS Printer Link)" section of this chapter.

LGATE-AJ

S8700 / S8500 / S8100

See BRI-SET, BRI-DAT, Various Adjuncts on page 520.

LGATE-BD

S8700 / S8500 / S8100

See BRI-BD/LGATE-BD (ISDN-BRI Line Circuit Pack) on page 491.

LGATE-PT

S8700 / S8500 / S8100

See BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port) on page 499.

LIC-ERR (License-Error Mode)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
LIC-ERR	MAJOR	**test license**	License-Error Mode

The LIC-ERR MO works with the NO-LIC MO to look for any errors and violations associated with a License file. Once a License file error occurs, LIC-ERR MO logs the error, raises an alarm, and starts a 10-day timer that is associated with the error. When the timer's threshold has been exceeded, NO-LIC MO causes the system to enter No License mode.

The license file is loaded onto a switch during initialization of the switch software, restoration of translations, and periodically. After initialization, a query is made to a software module called the License Server. This module:

- Reads the serial number in a License file
- Compares this file's serial number to a serial number in hardware
- Compares the file's serial number with a running software version

and (if a match occurs) delivers a new feature mask. The feature mask controls revenue-associated options.

Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)			MAJOR	OFF	See footnote[1]
513 (b)		None	MAJOR	OFF	See footnote[1]
769 (c)		None	MAJOR	OFF	See footnote[1]
1281 (d)		None	MAJOR	OFF	See footnote[1]
1537 (e)		None	MAJOR	OFF	See footnote[1]
1793 (f)		None	MAJOR	OFF	See footnote[1]
2305 (g)		None	MAJOR	OFF	See footnote[1]
2561 (h)		None	MAJOR	OFF	See footnote[1]

1 These error types can be cleared by providing the correct License file, per local instructions.

Notes:

a Error Type 1 — **S8700** / **S8500**: indicates that the reference IPSI is not responding. **S8300**: indicates that the G700 motherboard on which the serial number resides is not responding. **S8100**: indicates that the TN2314 circuit pack on which the serial number resides is not responding.

Either the reference is not responding or its serial number does not match the one in the Licence file, and the 10-day timer begins. When the 10-day timer expires, NO-LIC MO causes the system to enter No License Mode. See NO-LIC (No License) on page 1355 Error Type 1.

b Error Type 513 — indicates that the license has expired, and the 10-day timer has started. When the 10-day timer expires, NO-LIC MO causes the system to enter No License Mode. See NO-LIC (No License) on page 1355 Error Type 513.

c Error Type 769 — indicates that feature use has exceeded limits, if the license has expired and the 10-day timer begins. When the 10-day timer expires, NO-LIC MO causes the system to enter No License Mode.

d Error Type 1281 — indicates that a new license was not installed after an upgrade. A 10-day timer is started, see NO-LIC (No License) on page 1355 Error Type 1281.

e Error Type 1537 — indicates that the License file is missing or corrupt. A 10-day timer for a license error is started only if the previous state was Normal.

f Error Type 1793 — the current software version does not match the software version in the License file, and the 10-day timer has started. When the 10-day timer expires, NO-LIC MO causes the system to enter No License Mode.

g Error Type 1852 (**S8100**: 2305) — the Offer Category in translation does not match the Offer Category in the License file, and the 10-day timer has started. When the 10-day timer expires, NO-LIC MO causes the system to enter No License Mode.

h Error Type 2561 — during the last attempted license-file audit, the license server did not respond in time.

System Technician-Demanded Tests: Descriptions and Error Codes

Use **test license** to initiate a License File test.

Table 500: Test #1484 and Test #19 License File Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The system is in License-Error mode. For details, see Troubleshooting License File errors on page 1168.
2	FAIL	The system is in No-License mode. For details, see NO-LIC (No License) on page 1355.
1014	ABORT	Within the first 30 minutes after a system restart, the system cannot test the License file. **1** Enter **display initcauses** to find out when the system last restarted. **2** Wait for the remaining time plus 2 minutes, and retry the test.
	PASS	The system is in License-Normal mode.

Troubleshooting License File errors

The License file enables the switch's software category, release, features, and capacities. License Files are created using SAP order information and/or current customer configuration information.

Without a valid license installed or a mismatched license:

1. The system generates a major alarm.
2. Depending upon the nature of the error, a 10-day countdown timer starts, but Communication Manager continues unchanged.

The License file requires a serial number from:

- **S8700** / **S8500**: the reference IPSI circuit pack
- **S8100**: the reference TN2312AP IP Server Interface circuit pack
- **S8300**: the G700 motherboard

The License file includes a license serial identification number that is matched against the hardware in the system as well as information about the software version, Communication Manager and Call Center features, Offer Category, and capacities. Once installed or initialized, every hour the system compares these parameters, which determine the system status.

- **License-Normal** mode
  - License file was installed successfully
  - Feature use is within prescribed limits
  - License file's serial number matches the serial number of the reference IPSI
- **License-Error** mode
  - The License file's serial number reference source is not responding, or its serial number does not match the hardware
  - System software versions do not match
  - Feature use exceeded prescribed limits
  - License expired
  - After a system had a valid license, the License file is missing or corrupt.

    NOTE:
    System resets do not reset the 10-day timer. If a system in License-Error mode is reset and the license error remains, the timer picks up the countdown where it left off.

- **No-License** mode
  - System software versions do not match
  - License file is missing or could not be installed
  - Offer categories do not match
  - A condition that caused the system to enter License-Error mode has not been corrected or resolved, and the 10-day countdown timer has expired
  - The switch returns to License-Normal mode when every license error is cleared

To clear LIC-ERR alarms, the License file must match the switch hardware and administered parameters.

Login Warning Messages

Anyone logging onto the SAT (System Administration Terminal) when the system is in License-Error or No-License mode, receives a warning message stating the system's Licence mode, depending on the conditions.

Table 501 shows the 3 license modes, descriptions, and repair procedures.

Table 501: Error messages and repair procedures

License Mode	Description	Explanation and repair procedure
License-Normal	No mismatches between license and switch; stable running condition	None needed
License-Error	Warning mode; Communication Manager supported, 10-day countdown timer begins.	If you initially log into the SAT and a message says: `License-Error: xxxxx; Call Processing Will Be Blocked in Approximately X hours,` the 'xxxx' tells you why you are in License-Error mode. Communication Manager functions normally for 'X' hours, at which time the system goes into No-License mode. One of the following conditions is present: • Serial number reference source not responding. • The License file expired. • Feature use does not match the License file. Clear the License-Error mode by • Correcting the error or mismatch that caused going into this mode. • Installing a valid License file that is consistent with the switch.
No-License	Warning period has expired.	If you initially log into the SAT and a message says: `No-License: xxxxx; Call Processing Blocked`, the 'xxxx' tells you why you are in No-License mode. One of the following conditions is present: • No License file is installed in the system. • The License-Error timer expired. Clear No-License mode by: • Correcting the error or mismatch that caused going into this mode. • Installing a valid License file that is consistent with the switch parameters.

Initialization and Periodic Checking

When the switch initializes and hourly after that, the system checks every License file parameter. Table 502 shows the error messages that you can encounter as a result of these periodic checks and the associated License-Error and No-License modes.

Within the License file is the feature mask, an information set that controls which features are enabled or not on the Customer Options and Special Applications screens. Each of the approximately 150 feature mask entries is one of three types (examples in parentheses):

- **Type I** — features with a simple on/off state (DCS Call Coverage)
- **Type II** — features with an alphanumeric setting values associated with them (Logged-in ACD Agents)
- **Type III** — includes the product ID (license serial identification number), release number, and capacities.

  Type III features cannot be changed by any login under any circumstances. (IP Telephones, IP Softphones, IP Agents, and R300 Remote Office phones).

Table 502: Error messages indicating a change of mode

If the system goes into this mode...	And reports this error message...	It means that...
No-License	License File is Missing or Corrupted	License could not be decrypted. Checksum did not match, data possibly lost. Mismatched settings: Offer Category Version Call Center Release Model Min. and Max. values of "* and # in vector collect step" do not match the License file. IP product defined in translations but not defined in the License file.
No-License	The License has Expired	The license has expired.
No-License	Software Version Mismatch	The current software version does not match the software version in the License file.
No-License	Offer Category Mismatch	The Offer Category in translation does not match the Offer Category in the License file.

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Table 502: Error messages indicating a change of mode

If the system goes into this mode...	And reports this error message...	It means that...
License-Error	**S8700** / **S8500**: Golden IPSI Not Responding **S8100**: TN2314 Not Responding **S8300**: G700 Motherboard Not Responding	The reference source's serial number does not match the serial number in the License file, or the reference source is not responding.
License-Error	Feature Usage Exceeds Limits	The value of the `Used` field for any TYPE II or TYPE III field on the Customer Options forms (pages 1, 5, 6, and 9) is greater than the value of the field. To more quickly identify these TYPE II and TYPE III features is causing the error, compare the `Used` field with the value of the field itself (the License file value). Before usage is checked if the value of the field is not between the upper and lower values in the License file, the value of the field is changed in translation to the lower value in the License file.
License-Error	Software Upgrade Requires New License	The system reports this message immediately after an upgrade. You have 10 days in which to install the License file.

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LOG-SVN (Login Security Violation)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
LOG-SVN	MAJOR	**enable login *loginID***	Login Security Violation

1 Where ***loginID*** is the Avaya services login ID for which the security violation was detected. The **Alt Name** field indicates the login ID associated with the security violation and the major alarm.

The Security Violation Notification (SVN) feature provides notification when the number of failed attempts to access the system administration/maintenance interface meets or exceeds customer administered threshold parameters.

A major alarm is logged whenever a security violation is detected involving an Avaya services login ID and that login ID has been disabled as a result of detection of the security violation. The capability to disable a login ID following detection of a security violation involving that login ID is administrable on a per login ID basis.

Refer to the *Administrator's Guide for Avaya™ Communication Manager, 555-233-506,* for information about administration required for the Security Violation Notification feature, and the option to disable a login ID following detection of a security violation involving the affected login ID.

Error Log Entries and Test to Clear Values

Table 503: Security Violation Notification Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1–15	None	None	Major	OFF	**enable login** *loginID*

General Information about **log-svn** error log entries:

a The number (1–15), that appears in the error type field, corresponds to the location of the login in the internal login data structure.

b The *Alt Name* field on the alarm report indicates the login ID associated with the security violation and major alarm.

c These errors/alarms are associated with a number of failed attempts to access the system management/maintenance interface using an Avaya services login ID that meet or exceed the customer administered threshold parameters. The associated alarm is immediately raised as a major alarm.

d The affected login ID will be disabled as a result of detection of the security violation, unless it is the system's last enabled INADS-type login. The provision to disable a login ID following detection of a security violation involving that login ID is administrable on a login ID basis.

e Use **enable login** to enable a login that has been disabled, and to retire any login security violation alarms associated with the login ID.

f To use **enable login** to enable a login and/or retire alarms, use a login ID with greater service level hierarchy permissions.

g Access to **enable login** is controlled through the `Administer Permissions` field on the ***Command Permission Categories*** screen. Set the `Administer Permissions` field to **y** to access **enable login**.

h The `Port` alarm report field will set to the port where the final invalid login attempt, involving the alarmed login ID, was detected. Valid port values for G3i products include:

- MGR1 — Dedicated Manager 1 or G3 MT (management terminal) connection
- NET-n — Network controller's dial-up port
- INADS — Alarm receiver's port
- PN — PN's maintenance EIA port
- EIA — Other EIA port

Valid port values for G3r products include:

- SYSAM _LOC — Local administration port
- SYSAM _RMT — Remote administration port
- SYS_PORT — System port
- MAINT — Maintenance port

i The `Svc State` alarm report field will be set to `OUT` if the login ID is in the disabled state as a result of detection of a security violation involving the login ID. Once the login ID has been enabled, the field will be set to `IN`.

j The source or reason of the failed login attempts should be identified and the cause corrected prior to re-enabling a login ID and/or retiring any alarms associated with the login ID. The cause may be something as innocuous as the failure of Avaya services automatic login software, to something as insidious as a hacker attempting to gain access to the switch system management interface.

Prior to retiring an SVN alarm and enabling the associated login ID, use **monitor security-violations login** to access information about the invalid login attempts that caused the security violation. This information can be useful in determining the source of the invalid attempts and analyzing why they occurred.

Use **list logins** to see status information about logins on the system. If a login has been disabled as a result of a security violation, the status is `svn-disabled`.

Procedure to Retire SVN Alarm

To retire a SVN alarm:

1 Enter the **enable login *loginID***.

The login ID associated with that alarm is displayed in the *Alt Name* field of the alarm report and the alarm is retired.

MAINT (PN's Maintenance Circuit Pack)

S8700 MC

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
MAINT	MINOR	**test maintenance sh**	PN's Maintenance circuit pack
MAINT	MAJOR	**test maintenance l**	PN's Maintenance circuit pack

The PN's TN775D Maintenance circuit pack monitors and supports environmental maintenance for PN multicarrier or single-carrier cabinets. The PN's Maintenance circuit pack provides switch software with a mechanism to activate or deactivate Emergency Transfer in the PN. Control by the system of Emergency Transfer can be overridden by the Emergency Transfer switch on the faceplate of the circuit pack. The PN's Maintenance circuit pack invokes Emergency Transfer when the PN loses contact with the media server or when the PN's Maintenance circuit pack loses contact with every Expansion Interface circuit pack. The PN's Maintenance circuit pack handles loss of AC power in the PN multicarrier cabinet by supplying battery power for 15 seconds to the PN cabinet and then an additional 10 minutes of power to just the control carrier in the PN. When power fails in a single-carrier PN cabinet, no such power holdover is available. In the event that an Expansion Interface circuit pack goes insane and is reset six times within 15 minutes, the PN's Maintenance circuit pack will hold the Expansion Links reset preventing the Expansion Interface circuit pack from running.

The PN's Maintenance circuit pack has alarm LEDs which indicate the presence of Major, Minor, and Warning alarms. A flashing LED indicates the presence of an alarm within the cabinet. A continuously lit LED indicates the presence of an alarm elsewhere in the system.

Management terminal

A management terminal (G3-MT) can be directly connected to the PN's TN775D Maintenance circuit pack. This link operates at 9600 bps, but system software throttles the rate of data flow to the TN775D for display on the G3-MT to about 1200 bps. Every system command can be executed via the PN G3-MT login. However, due to the slow speed at which the PN login operates, it is recommended that it be used only for maintenance sessions and not for system administration.

Customer-provided alarming device (CPAD)

The system provides customers a way to connect their own alarm indication device to a switch. The CUST-ALM MO represents this customer-provided alarming device (CPAD).

The customer administers the level of alarm for which the CPAD will be activated via the **change system-parameter maintenance** screen (`CPE Alarm Activation Level` field). The customer sets this field to: **none, warning, minor,** or **major** depending on the level of alarm at which the CPAD should be activated. When an alarm occurs of at least the level to which the CPAD is administered, the CPAD in the PN will be activated. The CPAD will also be activated within a cabinet whenever Emergency Transfer is invoked within that cabinet.

The CPAD is connected to the PN's Maintenance circuit pack. The CUST-ALM MO is not maintained by the system, and will not generate any alarms. If a problem is suspected with the CPAD, it may be tested using the **test customer-alarm** command, which will activate the device by closing the relay on either the the PN's Maintenance circuit pack (whichever is specified) for 1 minute. The repeat parameter may be used to close the relay for a longer length of time where the number of the repeat is the number of minutes for which the device will be activated (5 minutes is the suggested repeat value).

NOTE:
S8700 and S8500 media servers equiped with G650 carriers will differ from this MO, in that the IPSI board provides the CPAD leads. The intent for the feature is in other ways the same.

The **test customer-alarm *UUC*** command is provided to allow a technician to check that the customer-provided alarming device is correctly installed and functional (See Customer-Provided Alarming Device Test (#115) on page 1186). It is recommended that this test be run at least once after both the switch and the customer alarm have been installed.

Connectivity paths

The media server communicates with a PN's Maintenance circuit pack via the following path. (Up-link messages back from this Maintenance circuit pack to the media server take the reverse path.) Messages flow from the media server's processor to an IPSI-connected PN's TN2312AP IPSI circuit pack's Packet Interface circuit, over this PN's LAN bus to its Expansion Interface circuit pack, across the fiber link to the active PN's Expansion Interface circuit pack, and over a serial link to the PN's Maintenance circuit pack.

The PN's Maintenance circuit pack must be physically inserted into the dedicated slot marked Maintenance in the A carrier of the PN. The serial links from the PN's Maintenance circuit pack to the Expansion Interface circuit packs are physically connected from this dedicated slot to slots 2A01 and 2B02 (2B02 is used only if there is duplicated Port Network Connectivity). The serial link from slot 2A01 to the maintenance slot is hard-wired into the backplane of carrier A, whereas the serial link from slot 2B02 to the maintenance slot is a ribbon cable connecting the two slots. The serial link from the PN's Maintenance circuit pack to the terminal is also a ribbon cable which plugs into a connector labeled TERM on the back of carrier A.

The maintenance strategy for the PN's Maintenance circuit pack consists of checking the integrity of the communications path to/from the PN's Maintenance circuit pack, testing individual hardware components on the PN's Maintenance circuit pack, and keeping the alarm LEDs up-to-date. The individual hardware components include the serial interfaces which handle the serial links connected to the PN's Maintenance circuit pack. There are three serial interfaces, one for each possible Expansion Interface circuit pack and one for the terminal.

Since the PN's Maintenance circuit pack supports environmental maintenance in the PN, trouble with the PN's Maintenance circuit pack can cause environmental maintenance to falsely detect problems. In a multicarrier cabinet PN, these environmental MOs include: POWER (Battery and Battery Charger), CARR-POW (Carrier Port Power Unit), AC-POWER (AC Power), CABINET (Cabinet Sensors), EMG-XFER (Emergency Transfer), EXT-DEV (External Device Alarm), and CUST-ALM (Customer-Provided Alarming Device). In a single carrier cabinet PN, these environmental MOs include DC-POWER (Single Carrier Cabinet Power), EMG-XFER (Emergency Transfer), EXT-DEV (External Device Alarm), and CUST-ALM (Customer-Provided Alarming Device).

TN775D Maintenance Circuit Pack Used with a TN2312AP IPSI Circuit Pack

Connectivity when installed in an Existing System

There is no backplane connectivity from the TN775D Maintenance circuit pack to the TN2312AP IPSI circuit pack in existing pre-R11carrier backplanes. To achieve connectivity for pre-R11 carriers, a faceplate cable must be used. The faceplate cable runs between the TN775D and the TN2312AP IPSI circuit packs faceplates.

NOTE:
The TN775D maintenance circuit pack is located in slot one of Control Carrier A. The associated TN2312AP IPSI circuit pack is located in slot two of Control Carrier A.

Backplane Connectivity when Installed in a New System

New systems PN Control Carriers have backplane connectivity between the TN775D Maintenance circuit pack located in slot one of the new PN Control Carrier and the TN2312AP IPSI circuit pack located in slot two. No face plate cable is needed.

Error Log Entries and Test to Clear Values

Table 504: PN's Maintenance Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test maintenance sh r 1
1 (a)	0 1	PN Maintenance Circuit Pack Reset test (#306)	MINOR	ON	test maintenance l
513 (a)	0 1	MGR I Channel Loop test (#228)	MINOR	ON	test maintenance sh r 3
769 (b)	Any	Sanity Handshake test (#106)			
1537 (c)	0 1	Sanity Maze test (#303)	MINOR	ON	test maintenance sh r 3
2049 (c)	Any	Battery Holdover Vintage Verification Test (#311)	WARNING	ON	test maintenance sh r 1
2561 (a)	0 1	Sanity Handshake test (#106)	MINOR	ON	test maintenance sh r 3
2817 (a)	0(b) 1	Serial Channel Loop test (#229)	MINOR	ON	test maintenance sh r 3
3329 (d)	Any	Serial Link Test (#337)	MINOR/ WARNING[2]	OFF	test maintenance sh r 3
3585 ()	Any	Serial Link Test (#337)	MINOR/ WARNING[2]	OFF	test maintenance sh r 3

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 Major and Minor alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a A value of 0 indicates that PNC-A (and therefore, the Expansion Interface circuit pack located on PNC-A) was active when this error occurred. A value of 1 indicates that PNC-B (and therefore, the Expansion Interface circuit pack located on PNC-B) was active when this error occurred. To clear this problem, make sure the active PNC is the same as that indicated by the Aux Value.

b Multiple values can appear in the `Aux Data` field. There will be other errors in the log if there is a real problem. Use these other errors to troubleshoot the problem.

c The PN's Maintenance circuit pack hardware vintage does not support battery holdover for ***all carriers***.

> **NOTE:**
> This failure indicates that the cabinet administration is set for battery holdover for ***all carriers***.

d Aux 0 indicates that the serial link between the Expansion Interface circuit pack in the A carrier and the PN's Maintenance circuit pack is defective. Aux data of 10 indicates that the serial link between the IPSI circuit pack in the A carrier and the PN's Maintenance circuit pack is defective.

Aux 1 indicates that the serial link between the Expansion Interface circuit pack in the B carrier and the PN's Maintenance circuit pack is defective. Aux data of 11 indicates that the serial link between the IPSI circuit pack in the B carrier and the PN's Maintenance circuit pack is defective.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Sanity Handshake test (#106), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Sanity Handshake test (#106)	X	X	ND
PN Maintenance Circuit Pack Reset test (#306)		X	D
Serial Channel Local Loop-around test (#229)	X	X	ND
MGR I Channel Local Loop-around test (#228)		X	D
PN Maintenance Circuit Pack Sanity Maze test (#303)	X	X	ND
PN Maintenance Circuit Pack Serial Link test (#337)	X	X	ND
Battery Holdover Vintage Verification test (#311)	X	X	ND
The following test is not part of the above test sequences:			
Customer-Provided Alarming Device Test (#115)			ND

1 D = Destructive, ND = Nondestructive

Sanity Handshake Test (#106)

This test checks the ability of a PN's Maintenance circuit pack's to respond to queries. A message is sent to the PN's Maintenance circuit pack which then sends a message back. If the response message is received, then the Maintenance circuit pack is queried for the PN cabinet type (valid PN cabinet types are

single carrier and multicarrier cabinets). The Maintenance circuit pack reads pins on the backplane of carrier A that identify the type of cabinet and report this information. If a valid cabinet type is returned, then the test passes.

Table 505: Test #106 Sanity Handshake Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error.
1000	ABORT	System resources required for this test are not available.
2000	ABORT	Response to cabinet query was not received in the allowable time period.
2033	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2046	ABORT	The PN's Maintenance circuit pack reported an invalid cabinet type. Not knowing the cabinet type of the PN will prevent all PN environment maintenance from running. **1** Retry the command. **2** If the test continues to abort with 2046, then either the PN's Maintenance circuit pack is defective, or the PN cabinet's wiring is defective. First, replace the Maintenance circuit pack. **3** If the test continues to abort with 2046, then the PN cabinet's wiring is defective in the A carrier, and the PN's Maintenance circuit pack cannot read the backplane pins to determine the cabinet type.
10601	ABORT	Test disabled via software patch.

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Table 505: Test #106 Sanity Handshake Test

Error Code	Test Result	Description / Recommendation
	FAIL	PN's Maintenance circuit pack did not respond to Sanity Handshake and the test timed out. **1** Verify that the carrier A power units are good. If the -5 Volt unit is defective in the A carrier, then communication with the PN's Maintenance circuit pack will not be possible. **2** If the -5 Volt unit is good and this test continuously fails, background maintenance will automatically escalate to a PN's Maintenance circuit pack Reset test (#306). Otherwise, manually reset a PN's Maintenance circuit pack by issuing **test maintenance long** and evaluating any generated error codes from Test #306. If Test #306 passes, this test should also PASS. Use the following steps to determine whether the PN's Maintenance circuit pack or its serial link, is defective: Duplicated Port Network Connectivity (PNC): **1** Switch PNC by entering **reset pnc interchange**. **2** Run the short test sequence against the PN's Maintenance circuit pack. If Test #106 still fails, replace the Maintenance circuit pack and retest. Otherwise, follow the error routines for any errors that are logged by this short test. Unduplicated PNC: **1** Replace the PN's Maintenance circuit pack, and invoke the short test sequence against it. **2** If error persists, replace the PN Expansion Interface circuit pack, at a time when the PN can go down with minimal inconvenience. **3** If the error still persists, the problem is with the actual serial link in A carrier backplane and not with the PN's Maintenance circuit pack.
	PASS	The communications path to and from the PN's Maintenance circuit pack is sane, and the Maintenance circuit pack can read and report the correct PN cabinet type. The Maintenance circuit pack may still have problems related to Tests #228, #229, #303, or #306.

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Management Terminal Channel Local Loop-Around Test (#228)

This test is **destructive**.

This test checks TN775D on-board circuitry associated with the serial link for the management terminal connection. This test will not cause the local terminal login to drop, but any data displayed on the terminal while the test is running will be lost.

The PN's Maintenance circuit pack has three separate serial interfaces, one to each of the following:

- Management terminal which is tested by Test #228
- Active EI circuit pack which is tested by Test #229
- Standby EI circuit pack which is tested by Test #229

Table 506: Test #228 Management Terminal Channel Local Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available.
2000	ABORT	Response to the test was not received within the allowable time period.
2033	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2034	ABORT	Background maintenance on the PN's Maintenance circuit pack is running the MGR I Channel Local Loop-around test. **1** Wait 30 seconds and retry the test up to 5 times.
22801	ABORT	Test disabled via software patch.
	FAIL	Test failed which means the PN terminal is not usable. **1** Run the test three more times. **2** If the test continues to fail, replace the PN's Maintenance circuit pack.
	PASS	The serial interface circuitry on the PN's Maintenance circuit pack which controls the PN-connected terminal is functioning properly. If there are still troubles with the PN G3-MT terminal, the problem may be one of the following: **1** The PN-connected terminal is not configured properly. The connection between the terminal and the PN's Maintenance circuit pack must be set up at 9600 bps. **2** The serial link from the back of carrier A to the PN terminal may be defective. The serial link consists of the connector on the back of carrier A labeled TERM and the ribbon cable running to the terminal. **3** The terminal may be defective. Try another terminal. **4** Since this test is not 100 percent accurate, there may still be problems with the PN's Maintenance circuit pack.

Serial Channel Local Loop-Around Test (#229)

This test checks TN775D on-board circuitry associated with the serial links to the Expansion Interface circuit packs. A request is sent to the PN's Maintenance circuit pack over the active link via the active Expansion Interface circuit pack serial interface circuitry to test the serial interface circuitry of the standby Expansion Interface circuit pack link. If a response is received, then by definition the serial interface circuitry associated with the active link is good.

The PN's Maintenance circuit pack has 3 separate serial interfaces, one to each of the following:

- Management terminal which is tested by Test #228
- Active EI circuit pack which is tested by Test #229
- Standby EI circuit pack which is tested by Test #229

Table 507: Test #229 Serial Channel Local Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test request was not received within the allowable time period.
2033	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2034	ABORT	Background maintenance on the PN's Maintenance circuit pack is running the Serial Channel Local Loop-around test. **1** Wait 30 seconds, and retry the test up to 5 times.
22901	ABORT	Test disabled via software patch.
	FAIL	The on-board circuitry associated with the standby serial link is defective. Since the PN's Maintenance circuit pack reported this failure, the on-board circuitry associated with the active serial link is functional. **1** This test checks the circuitry on the PN's Maintenance circuit pack associated with the standby Expansion Interface link. a. In a switch without duplicated Port Network Connectivity (PNC), current service will not be affected because the circuitry failing is not being used. Nevertheless, a Minor alarm will remain in the Alarm Log against MAINT. Therefore, the PN's Maintenance circuit pack must be replaced. b. In a switch with duplicated PNC, service is not affected as long as you **do not** interchange the PNCs. Otherwise, the connection to the PN's Maintenance circuit pack will be lost. Losing this connection would mean losing connectivity to the terminal and PN Environment maintenance. The PN's Maintenance circuit pack must be replaced to correct this problem.
	PASS	The on-board circuitry associated with both Expansion Interface circuit pack serial links is good. If there is still a problem communicating with the PN's Maintenance circuit pack, check the following: **1** The cable comprising the serial link (B carrier Expansion Interface circuit pack to PN's Maintenance circuit pack only) may be defective. **2** The PN's Maintenance circuit pack may actually be defective. This test may not be 100 percent accurate. **3** The Expansion Interface circuit pack on the standby link may be defective.

PN Maintenance Circuit Pack Sanity Maze Test (#303)

The processor on the PN's Maintenance circuit pack has direct access to special registers in the Maintenance circuit pack. These registers are tied to such things as the Expansion Interface circuit pack reset leads and Carrier Port Power Unit reset leads (which enable the PN's Maintenance circuit pack to recycle carriers). To prevent an insane Maintenance circuit pack from inadvertently controlling these external devices, a special interface called the Sanity Maze is provided that must first be navigated by the Maintenance circuit pack processor prior to any register access. There are two parts to the test. Part 1 involves navigating the Sanity Maze to toggle an unused lead. Part 2 attempts to toggle an unused lead without first navigating the Sanity Maze. The Sanity Maze test passes if Part 1 is successful and Part 2 fails.

Table 508: Test #303 PN's Maintenance Circuit Pack Sanity Maze Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test was not received within the allowable time period.
2033	ABORT	**1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Sanity Maze of the PN's Maintenance circuit pack is defective. **1** Replace the PN's Maintenance circuit pack.
	PASS	The Sanity Maze is working properly, and the PN's Maintenance circuit pack can access the unused register. If **recycle carrier** (for PN carriers) does not work, the following problems may still exist: **1** The Carrier Port Power Unit or wiring to the Carrier Port Power Unit may be defective. See CARR-POW (Carrier Power Supply) on page 578. **2** Since this test only tests the PN, there is a very small probability that the PN's Maintenance circuit pack cannot access those registers that deal with PN devices. The Maintenance circuit pack may need to be replaced.

PN Maintenance Circuit Pack Reset Test (#306)

This test is **destructive**.

The terminal connection will be dropped and, if the Emergency Transfer switch is in the AUTO position, Emergency Transfer will be disabled for the duration of the test.

The PN's Maintenance circuit pack is reset by the active Expansion Interface circuit pack. After the Expansion Interface circuit pack reports that the PN's Maintenance circuit pack has reset, a handshake message is sent to the Maintenance circuit pack. If the Maintenance circuit pack responds to the handshake, the test passes. If not, it fails. If the test passes, the PN-connected terminal is brought back up, and Emergency Transfer is restored to its previous state.

Table 509: Test #306 PN Maintenance Circuit Pack Reset Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled via software patch.
2029	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1204	FAIL	
1205		EI circuit pack could not reset the PN's Maintenance circuit pack. For duplicated Port Network Connectivity: **1** The standby EI circuit pack may be defective, preventing the active EI circuit pack from resetting the PN's Maintenance circuit pack. Unplug the standby EI circuit pack, and try to reset the Maintenance circuit pack using **test maint long**. If Test #306 passes, replace the standby EI circuit pack, and attempt the reset test again. If Test #306 fails, then replace the standby PN EI circuit pack. **2** The active EI circuit pack may be defective and unable to reset the PN's Maintenance circuit pack. Interchange the PNC using **reset pnc interchange**. Reset the Maintenance circuit pack again using **test maintenance long**. If the test passes, the problem is with the known standby EI circuit pack. Repeat Step 2 to determine whether the standby EI circuit pack should be replaced.
1205 *(cont'd)*		**3** Replace the PN's Maintenance circuit pack, and run the test again. If the test passes, the problem is with the Maintenance circuit pack. Interchange the PNC by entering **reset pnc interchange**, and run the test again. The test should pass with both EI circuit packs being active. **4** If the B carrier EI circuit pack is active, the ribbon cable connecting the Expansion Interface circuit pack and the PN's Maintenance circuit pack may be defective. Check the ribbon cable to make sure it is connected properly and is not damaged. For unduplicated Port Network Connectivity: **1** Replace the PN's Maintenance circuit pack, and run the test again. If it passes, the problem is with the Maintenance circuit pack. **2** If the test fails, replace the EI circuit pack. If the tests passes, the problem is with the EI circuit pack. **3** If the test still fails, the problem is with the serial link wired into the backplane of carrier A.

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Table 509: Test #306 PN Maintenance Circuit Pack Reset Test

Error Code	Test Result	Description / Recommendation
2005	FAIL	PN Maintenance Circuit Pack reset passed, but the PN's Maintenance circuit pack did not respond to subsequent handshake message. Retry this command three more times. If it continues to fail, the Maintenance circuit pack, the active EI circuit pack, or the serial link is defective. To determine which is defective: For Duplicated Port Network Connectivity: **1** Interchange PNCs by entering **reset pnc interchange**. **2** Run the short test sequence against the PN's Maintenance circuit pack. If Test #306 still fails, replace the Maintenance circuit pack and retest. Otherwise, follow the error routines for any errors that are logged by this short test sequence. For Unduplicated Port Network Connectivity: **1** Replace the PN's Maintenance circuit pack, and invoke the short test sequence against it. **2** If the error persists, replace the EI circuit pack, at a time when the PN can go down with minimal inconvenience. **3** If the error still persists, the problem is with the actual serial link in A carrier backplane and not with the PN's Maintenance circuit pack.
	PASS	The active EI circuit pack can reset the PN's Maintenance circuit pack. This implies the Maintenance circuit pack, the active EI circuit pack, and active serial link are sane. There could still be a problem with the standby EI circuit pack and standby serial link in a Duplication Option system.

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Battery Holdover Hardware Verification Test (#311)

The hardware/firmware vintage of the PN's TN775D Maintenance boards does not support battery holdover for ***all carriers***. This test checks to see if PN cabinet battery holdover for ***all carriers*** has been administered in error. If battery holdover is administered for ***all carriers***, the test will fail and a WARNING alarm will be raised against this MO.

Table 510: TEST #303 PN Maintenance Circuit Pack Sanity Maze Test

Error Code	Test Result	Description/ Recommendation
1000	ABORT	System resources required to run this test are not available.
2000	ABORT	Response to the test was not received within the allowable time period.
2029	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 510: TEST #303 PN Maintenance Circuit Pack Sanity Maze Test

Error Code	Test Result	Description/ Recommendation
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The hardware vintage of the PN's Maintenance circuit pack does not support battery holdover for ***all carriers***. This failure indicates that the cabinet administration is set for battery holdover for ***all carriers***. **1** Verify cabinet administration, make sure that the battery holdover feature is administered correctly (That cabinet administration is not set for battery holdover for ***all carriers***.). **2** Retry the command at 1-minute intervals up to 5 times.
	PASS	The cabinet administration shows battery holdover for A carrier only. Also, the hardware vintage of the PN's TN775D Maintenance board is correct.

2 of 2

PN Maintenance Circuit Pack Serial Link Test (#337)

This test is **destructive**.

This test checks the serial link from the standby EI or standby IPSI circuit pack to the PN's Maintenance circuit pack. If there is no standby link, or the standby link is down at the time of the test, this test aborts.

NOTE:
The status of the link changes to "down" when the standby EI or standby IPSI circuit pack begins initialization tests (for example, after being reset). The link status updates at the conclusion of these tests.

Table 511: Test #337 PN Maintenance Circuit Pack Serial Link Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2029	ABORT	
2500		Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 511: Test #337 PN Maintenance Circuit Pack Serial Link Test

Error Code	Test Result	Description / Recommendation
	FAIL	The serial link between the currently standby EI or standby IPSI circuit pack and the PN's Maintenance circuit pack is defective. If the standby EXP-INTF or IPSI is on Carrier A, then error type 3329 is logged. If the standby EXP-INTF or IPSI is on Carrier B, then error type 3585 is logged. **1** If error type 3585 was logged: • check to see if the ICCA/ICCB cables between carriers A and B are present and properly connected (ICCA to ICCA, and ICCB to ICCB). • check to see if the ICCC/ICCD cables between carriers A and B are present and properly connected (ICCC to ICCC, and ICCD to ICCD). • If the IPSI has faceplate ICC cables check to see if the faceplate cables between the IPSIs and Maintenance circuit pack are properly connected. **2** Install or reconnect the cables if necessary, and rerun the test. **3** Replace the PN's Maintenance circuit pack. **4** Rerun the test. If the test continues to fail, replace the standby PN Expansion Interface circuit pack. **5** Rerun the test. If the test continues to fail and the standby link is on B side, replace the ICC cable or IPSI faceplate cable that carries the serial link from Expansion Interface or IPSI circuit pack B to the PN's Maintenance circuit pack.
	PASS	The serial link from the standby Expansion Interface or IPSI to the PN's Maintenance circuit pack is working.

2 of 2

Customer-Provided Alarming Device Test (#115)

Within a specified PN, the Customer-Provided Alarming Device (CPAD) test closes the relay that activates the CPAD for 1 minute. If more than 1 minute is necessary to verify the CPAD's activation, the `Repeat` field on the **test customer-alarm *UUC*** command can be used to close the relay for up to 99 minutes.

However, when the repeat option is used, the results for Test #115 come back immediately and, for each test that passed, the CPAD is kept on for one minute. The CPAD does not go off after the PASS result and then come back on for a repeat. Instead, the CPAD is kept on continuously for the entire time. If the CPAD is being activated and deactivated in a flickering fashion, there is a problem with either the CPAD or a PN's Maintenance circuit pack.

Table 512: Test #115 Customer-Provided Alarming Device Test

Error Code	Test Result	Description / Recommendation
Any **S8100**: (blank) 1000 2029	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The switch software successfully sent the request to the PN's Maintenance circuit pack to turn on the CPAD. The CPAD must be physically inspected to verify that it is working. **1** If the CPAD is working but a customer complains that the CPAD did not indicate an actual system alarm: a. Enter **display system-parameter maintenance** to check the administered alarm-activation level. b. Compare this level with the customer's specifications. If the level does not match the customer's specifications, change it using the **change system-parameter maintenance** screen. **2** If Test #115 passes but the CPAD is not being activated, check the CPAD's connection to the PN's Maintenance circuit pack, or to the IPSI circuit pack in an IPSI-connected system. **3** If the CPAD can be activated but not deactivated, enter **status port-network** to verify that Emergency Transfer is not activated in the affected PN. **G650**: Enter **status cabinet** to verify that Emergency Transfer is not activated in the affected cabinet. Emergency Transfer can be forced to manual OFF via the Emergency Transfer switch on the PN's Maintenance circuit pack, or by issuing the command **set emergency-transfer** for the TN2312BP circuit pack. **4** If Emergency Transfer is OFF and the CPAD still cannot be deactivated: c. Enter **display system-parameter maintenance** to check the administered CPAD alarm levels. d. Enter **display alarms** to compare the CPAD levels against those currently present in the system.

MAPD-BD (MAPD Interface Circuit Pack TN802)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MAPD-BD	MAJOR	**test board *location* sh**	MAPD Interface circuit pack
MAPD-BD	MINOR	**test board *location* l**	MAPD Interface circuit pack
MAPD-BD	WARNING	**test board *location* sh**	MAPD Interface circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN802 Multiple Application Platform (MAP-D) circuit pack allows sending voice and fax from a Communication Manager media server through the Internet to another Communication Manager media server also having this feature or to other PBXs that are equipped with the Internet Telephony server (ITS-E).

Throughout this section, the term TN802 means the MAP-D IP trunk circuit pack.

Be sure to observe these special considerations for the TN802:

- Port alarms on this circuit pack display as "TIE-DS1" in the Alarm and Error logs.
- The **reset board** command reboots the MAPD PC CPU, but **busyout board** only busies out every emulated port on the board.
- Switch resets that take the switch out of service for more than 20 seconds also cause the MAPD's PC to reboot, which takes several minutes to complete.

Switch-Demanded Tests

Switch-demanded diagnostic tests on the TN802 do not run unless the Internet trunking application is running on Windows NT™, located on the circuit pack.

Feature Limitations

The Internet trunking application relies on the single call scenario, or a direct, point-to-point call that does not terminate at multiple S8700 Media Server nodes through call processing. Table 513, IP trunk feature/performance limitations, on page 1188 describes the feature limitations for S8700 Media Server.

Table 513: IP trunk feature/performance limitations

Feature/ Performance	Description	Recommendation
Abbreviated Dialing	Abbreviated Dial strings with embedded pauses lose digits after the pause	Most calls work. Do not create Abbreviated dial strings with embedded pauses.

1 of 2

Table 513: IP trunk feature/performance limitations

Feature/ Performance	Description	Recommendation
Compression limitations	Every IP trunk call goes through A/D conversion, which uses compression to reduce bandwidth. Each compression degrades the voice signal and creates call processing delay.	No more than 3 compression/ decompression cycles for any call. The compression/decompression that most voice mail systems use must be counted as 1 cycle.
Call Classifier	IP trunk's compression/ decompression cycle makes ringback, busy and voice detection	Do not administer these features: • Call Coverage Redirected Off-Net (CCRON) • Certain wireless phone coverage
Call Coverage Call Forwarding Call Transfer	**S8100**: Calls extended across multiple DCS nodes or accross multiple facilities require multiple call paths. Significant voice quality degradation is likely.	Multiple call paths not recommended
Conferencing	Voice quality and delay problems if the party controlling the conference is on the IP trunk (voice paths from external callers come in on the IP trunk, are conferenced, then sent out to other external parties across an IP trunk)	Avoid conference calls where at least two other parties are on the other side of the IP trunk. The following conferences work OK: • Conferences of parties on the local media server • Conferences controlled by the local media server, involving local parties and only 1 party on the other side of an IP trunk
DCS	Know limitations: • Auto Callback	Coordinate specific administration and between the IP trunk and Communication Manager for any DCS functionality. Some limitations on routing flexibility may apply.
ISDN	IP trunking has no signalling capability.	ISDN not supported. This includes: • 10-digit number display • QSIG • Path replacement
Voice mail	Calls that have terminated at one location and then cover to a second site for voice mail coverage can have voice quality degradation.	Centralized voice mail through an IP network is not recommended.

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Backing Up to the PCMCIA Disk

Table 514, Backing up TN802 administration data, on page 1190 details how to back up administration data for the IP trunk application to and restored from the local PCMCIA disk and the Ethernet port. Before backing up, be sure to shut down the application running on the circuit pack, following the procedures in Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205.

Table 514: Backing up TN802 administration data

Step	Description	Comments
1	Busyout circuit pack	At the S8700 Media Server terminal, type **busyout board *UUCSS*** (the address of the TN802 circuit pack), and press Enter.
2	Backup administration TN802 to disk	At the Windows 2000 desktop, double-click on the **IP Trunk Backup Restore** icon. The IP Trunk Backup/Restore Utility screen appears.
3	Select utility	In the IP Trunk Backup/Restore Utility dialog screen, click on **Files, Backup**. The IP Trunk Backup screen appears.
4	Select backup	In the IP Trunk Backup screen, click on the **Backup** button.
5	Wait	Backup can take as much as 20 minutes to complete.
6	Release circuit pack	At the S8700 Media Server terminal, type **release board *UUCss*** (the address of the TN802 circuit pack), and press Enter.

NOTE:
Local restore of a complete system from the PCMCIA disk should not require more than 20 minutes assuming that a replacement MAPD pack is available and pre-loaded with the IP trunk application software.

Restoring Data from the PCMCIA Disk

Before You Start

1. Shut down the application running on the circuit pack. See Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205.
2. Remove the defective IP Trunk circuit pack from the switch (if applicable).
3. Install the replacement IP Trunk circuit pack in the switch (if applicable).
4. Insert the backup diskette into the IP Trunk circuit pack.

Table 515: Restore TN802 administration data

Step	Description	Comments
1	Restore IP Trunk administration	At the Windows 2000 desktop, double-click on the IP Trunk Back UP Restore icon. The IP Trunk Backup/Restore Utility screen appears.

1 of 2

Table 515: Restore TN802 administration data

Step	Description	Comments
2	Select utility	In the IP Trunk Backup/Restore Utility dialog screen, click **Files, Restore**. The IP Trunk Backup screen appears.
3	Select restore	In the IP Trunk Backup screen, click on the **Restore** button.
4	Wait	Wait until the amber Disk-In-Use LED (Note 5 in Figure 55) light is out.

2 of 2

PSTN Fallback Feature

The Public Switched Telephone Network (PSTN) fallback feature is available on the Internet trunk application software, which periodically pings the remote destinations that the software calls. When the far end returns a poor response time to the ping, ARS or AAR network routing patterns bypass those ports and direct the call to another port, typically on a PSTN trunk.

When the remote destinations show acceptable response times to subsequent pings, the corresponding ports are returned to “idle,” where they are available for service.

Cabinet Configuration

Because of overheating, the TN802 circuit pack should not be placed directly above or below another MAPD circuit pack.

UPS Protection

An uninterruptable power supply (UPS) protection is strongly recommended for a PN containing a TN802 circuit pack.

Faceplate

Figure 90, TN802 faceplate, on page 1192 shows the TN802 faceplate.

Figure 90: TN802 faceplate

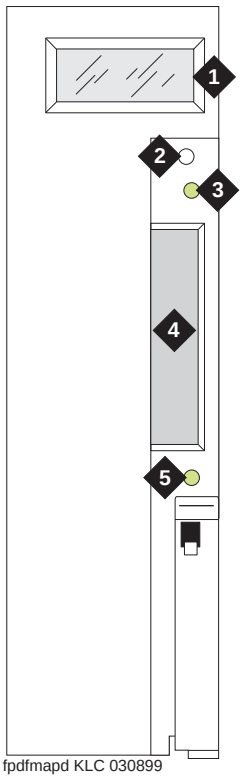

Figure Notes:

1 LCD display (see Table 516, TN802 LCD messages for IP trunks, on page 1192)

2 Reset button (recessed)

3 Red board-status LED

4 PCMCIA card slot

5 Amber PCMCIA disk-in-use LED

Table 516, TN802 LCD messages for IP trunks, on page 1192 lists the TN802 LCD messages that you might see if installing or servicing an IP Trunk.

Table 516: TN802 LCD messages for IP trunks

Display	Explanation
PC BOOT	The TN802 MAPD PC is booting up.
IP TRK #	IP Trunk application is running (# character blinks).
IML DWN #	Internal error on the IP Trunk. System shuts down and sends an error message to the board.
MSHUT #, where both MSHUT and # are blinking	The system is in the process of shutting down due to a front panel button press. Do not attempt to remove board.
MSHUT #, where # is blinking	The system has shut down gracefully.

Support for Laptop PCs

S8700 / S8500

Field technicians can access the TN802 circuit pack through:

- pcAnywhere®client software
- A directly-connected keyboard, monitor, and mouse

pcANYWHERE® Client Software

1. Attach a male-to-male serial cable and a NULL modem connector (if not built into the cable you use) to the COM2 connector (Note 8 in Figure 56 on page 1115) Attach the other end to the serial port of your laptop.
2. Launch the pcANYWHERE® application.
3. Click on Add Remote Control Item.
4. In the Properties window, choose the communication port to which you connected the cable in Step 1.
5. Click on Details and configure the settings (Table 517, Remote connection settings, on page 1193):

Table 517: Remote connection settings

Field	Value
Speed	38,400
Parity	None (default)
Flow Control	RTS/CTS
Started by	Carrier detect (DCD)
Ended by	Carrier detect (DCD)

6. Click on the new item icon, and the laptop connects to the host pcANYWHERE® application on the TN802 circuit pack.

Figure 91: TN802 external cable assembly

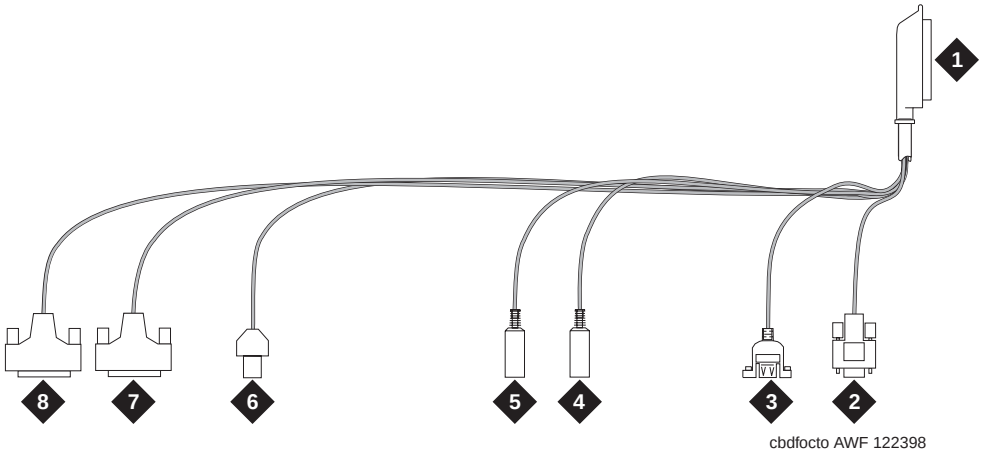

Figure Notes:

1	To TN802 cabinet backplane	**5**	Mouse
2	VGA monitor	**6**	Ethernet
3	USB (Universal Serial Bus)	**7**	25-pin modem connection
4	Keyboard	**8**	25-pin COM2 connection

S8700 / S8500 / S8100

Directly-Connected Keyboard, Monitor, Mouse

You need 2 power sources for the monitor and the modem in order to complete this procedure.

The TN802 circuit pack must be booted with a local mouse and keyboard connected to it for these devices to work.

1. Connect the VGA monitor to the VGA connector of the TN802 external cable.
2. Plug the monitor into an AC power receptacle, and turn it on.
3. Attach the keyboard to the keyboard connector of the TN802 external cable assembly.
4. Attach the mouse to the mouse connector of the TN802 external cable assembly.
5. Insert the circuit pack to cause it to boot.

Troubleshooting LAN Connections

This section contains information for troubleshooting

- ‘‘External Connections to the LAN’’
- ‘‘Internal Connections to the LAN’’

External Connections to the LAN

Test the external connections to the LAN by pinging the local host, the external IP trunk server, and another device connected to the network.

1 Click **Start** in Windows (lower left-hand corner), then select **Programs**, then **Command Prompt**.

This starts a DOS command-line session.

2 At the command prompt, type **ping *127.0.0.1*** (the local host’s default address), and press **Enter**.

If configured correctly, the system displays:

```
Reply from nnn.nn.nn.nn: bytes=32 time<##ms TTL=###
```

If there is no reply, escalate the problem or replace the circuit pack. The problem is not with the external network but within the circuit pack.

3 At the command prompt, type **ping *nnn.nn.nn.nn*** (the external IP trunk server’s address), and press **Enter**.

If configured correctly, the system displays:

```
Reply from nnn.nn.nn.nn: bytes=32 time<##ms TTL=###
```

If there is no reply, verify the IP address and check the physical connections to and from the TN802 circuit pack.

4 At the command prompt, type **ping *nnn.nn.nn.nn*** (the IP address of another computer on the network), and press Enter.

If configured correctly, the system displays:

```
Reply from nnn.nn.nn.nn: bytes=32 time<##ms TTL=###
```

If there is no reply:

a Verify the IP address.

b Check the physical connections to and from the TN802 circuit pack.

c Check the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 93, TN802 board assembly and cables (side view), on page 1198).

d Try pinging another device in the same subnet.

e Try pinging the gateway to the rest of the network from the subnet.

f Try pinging a device outside the local subnet but inside the network or another subnet.

5 When finished, type **exit** at the command prompt, and press **Enter**.

Internal Connections to the LAN

Test the internal connections to the LAN by pinging the local host, an internal IP trunk server, and another device connected to the network.

1. Click **Start** in Windows (lower left-hand corner), then select **Programs**, then **Command Prompt**.

   This starts a DOS command-line session.

2. At the command prompt, type **ping *127.0.0.1*** (the local host's default address), and press **Enter**.

   If configured correctly, the system displays:

   ```
   Reply from nnn.nn.nn.nn:  bytes=32 time <##ms TTL=###
   ```

   If there is no reply:

   a. Check that the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 58) have not worked loose.

   b. Otherwise, replace the circuit pack.

3. At the command prompt, type **ping *10.32.64.97*** (the internal IP trunk server's address), and press **Enter**.

   If configured correctly, the system displays:

   ```
   Reply from nnn.nn.nn.nn:  bytes=32 time <##ms TTL=###
   ```

   If there is no reply:

   a. Check that the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 58) have not worked loose.

   b. Otherwise, replace the circuit pack.

4. At the command prompt, type **ping *10.32.64.96*** (the IP address of the internal Motorola MPC860 processor), and press **Enter**.

   If configured correctly, the system displays:

   ```
   Reply from nnn.nn.nn.nn:  bytes=32 time <##ms TTL=###
   ```

   If there is no reply:

   a. Check that the internal cables on the TN802 circuit pack (Notes 4 and 6 in Figure 58) have not worked loose.

   b. Otherwise, replace the circuit pack.

5. Ping the gateway: at the command prompt, type **ping *XX.XXX.XXX.XXX*** (the IP address of the gateway), and press **Enter**.

6. When finished, type **exit** at the command prompt, and press **Enter**.

Board Assembly and Cables

Figure 92, TN802 board assembly, on page 1197 shows the circuit pack with the two additional boards connected through the side plane.

Figure 92: TN802 board assembly

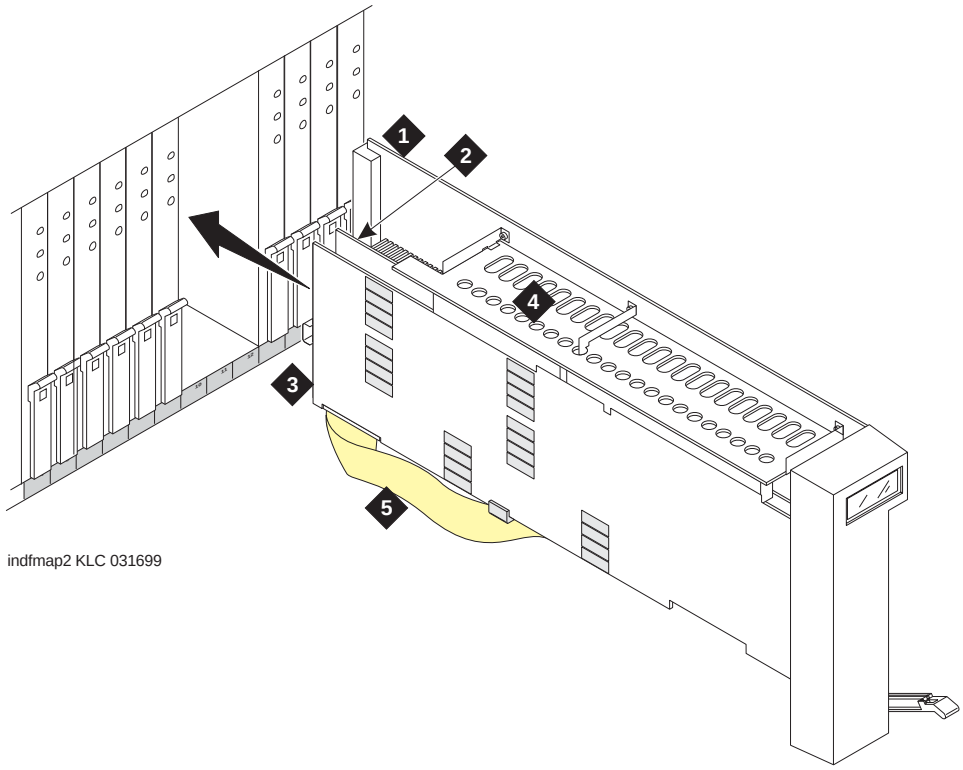

Figure Notes:

1	Main TN802 board	**4**	Side plane
2	Texas Microsystems Inc. (TMI) board	**5**	SCSA (Signal Computing System Architecture) ribbon cable
3	Analogic board		

Figure 93, TN802 board assembly and cables (side view), on page 1198 shows a side view of the three boards and interconnecting cables that make up the TN802.

Figure 93: TN802 board assembly and cables (side view)

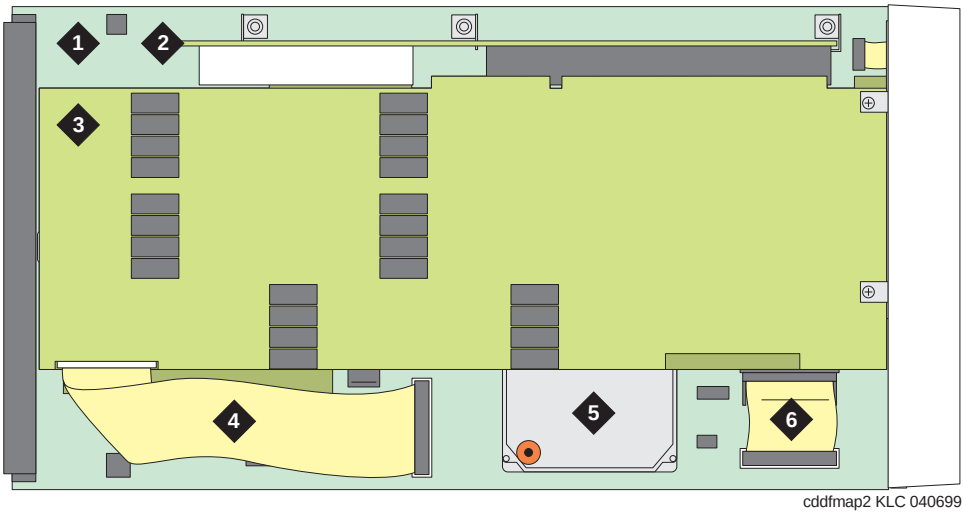

Figure Notes:

1	Main TN802 board	**4**	SCSA (Signal Computing System Architecture) ribbon cable
2	Side plane	**5**	Hard drive
3	Analogic board	**6**	Processor I/O ribbon cable

Figure 94, TN802 board assembly and cables (end view), on page 1199 shows the end view of the three boards and interconnecting cables on the TN802.

Figure 94: TN802 board assembly and cables (end view)

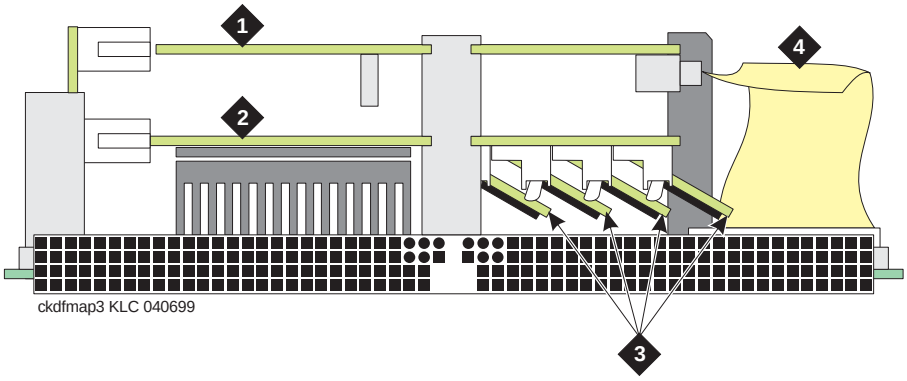

Figure Notes:

1	Analogic board	**3**	SIMMs (memory)[1]
2	TMI (Texas Microsystems Inc.) board	**4**	SCSA (Signal Computing System Architecture) ribbon cable

1 If the board is seated and you hear fast beeping, it means that one of the small boards containing the memory chips is dislodged. Secure the memory board firmly in the receptacle and reseat the circuit pack.

Replacing the Hard Disk

The TN802 hard drive (Note 5 in Figure 58) can be replaced in the field.

Table 518: Replacing the TN802 hard drive *1 of 2*

Step	Description	Comments
1	Shut down Windows 2000.	Shut down Windows 2000 by either method described in Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205.
2	Remove the circuit pack.	Unlatch the circuit pack, and remove it from the carrier.
3	Remove the hard drive.	Remove the 2 screws, and lift the hard drive out of its mounting bracket.

Table 518: Replacing the TN802 hard drive *2 of 2*

Step	Description	Comments
4	Replace the hard drive.	Position the new hard drive in the mounting bracket, and replace the 2 screws (Step 3).
5	Replace the circuit pack.	Slide the circuit pack into the slot, and lock the latching lever.
6	Wait for initialization.	Wait for: • the circuit pack to reseat (faceplate LEDs light go out) • Windows 2000 boots (PC BOOT appears on the faceplate LCD) • IP Trunk application to run (IP TRK # appears on the faceplate LCD)

Error Log Entries and Test to Clear Values

Table 519: MAPD (TN802) Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board *UUCSS*
1 (a)	0	Circuit pack removed or SAKI test (#53)	MIN/ WRN[2]	ON	
2 (b)					
18 (c)	0	busyout board UUCSS	WRN	OFF	release board *UUCSS*
S8100: 23 (d)	0		WRN	OFF	add ds1 UUCSS
S8100: 125 (e)	none 3	None	MIN/ WRN[3]	ON	
S8100: 257	65535	Control Channel Loop Test (#52)	MIN	ON	test board UUCSS l r 20
257 (f)	Any	None			
513 (g)	Any		MIN/ WRN[3]	ON	
514 (h)	46086		MIN/ WRN[3]	ON	
769 (i)	46085		MIN/ WRN[3]	ON	
770 (j)	46096		MIN/ WRN[3]	ON	
1025 (d)	4363	NPE Audit test (#50)			

1 of 2

Table 519: MAPD (TN802) Error Log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1281	Any	Loss of Signal Alarm Inquiry test (#138)	MIN/ WRN[3]	OFF	test board *UUCSS*
1537 (k)	46082		MIN/ WRN[3]	ON	
1538 (l)	Any		MIN/ WRN[3]	ON	
1793	Any	Blue Alarm Inquiry test (#139)	MAJ/ MIN/ WRN [4]	OFF	test board *UUCSS*
2049	Any	Red Alarm Inquiry test (#140)	MIN/WRN [3]	OFF	test board *UUCSS*
2305	Any	Yellow Alarm Inquiry test (#141)	MIN/ WRN[3]	OFF	test board *UUCSS*
2306	Any	Yellow Alarm Inquiry test (#141)	MIN/ WRN[3]	OFF	test board *UUCSS*
2561	Any	Major Alarm Inquiry test (#142)	MIN/ WRN[3]	OFF	**test board** *UUCSS*
2817		Minor Alarm Inquiry test (#143)	MIN/ WRN[3]	OFF	**test board** *UUCSS*
3073 to 3160 (m)	Any	Slip Alarm Inquiry test (#144)	MIN/ WRN[3]	OFF	**test board** *UUCSS* **r 6**
3330 (n)	46083		MIN/ WRN[3]	ON	
3585 to 3601 (o)	Any	Misframe Alarm Inquiry test (#145)	MIN/ WRN[3]	OFF	**test board** *UUCSS* **r 6**
3840 (p)	Any	None			
3841 (q)	4358				
3842 (r)	46097				
3843 (s)	46081				
3999 (t)	Any	None			

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.

3 Minor alarms on this MO may be downgraded to warning alarms based on values set in the **set options** command.

4 Major alarms on this MO may be downgraded to minor or warning based on values in **set options**.

Notes:

a **Error Type 1** — Indicates that the circuit pack has totally stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be fully administered, a MAPD circuit pack must:

- Have an entry in the circuit plan (**change circuit-pack**)
- Be administered (**add ds1 *UUCSS***)
- Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit plan and the other two conditions are *not* met, a MINOR alarm is logged. To resolve the error:

- Make sure the circuit pack is properly administered and that a functioning MAPD circuit pack is inserted in the correct slot

  or

- Completely remove the MAPD-BD from the system:

  1 Shut down Windows 2000. See Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205.

  2 Remove any administered DS1 trunks, access endpoints, or PRI endpoints associated with the circuit pack from their respective trunk groups.

  3 Remove the DS1 (**remove ds1 *UUCSS***) and circuit pack (**change circuit-pack *UUCSS***) administration.

If the circuit pack is properly administered and the red LED is still on, follow the instructions for LED alarms without Alarm Log entry or with Error Type 1 on page 27.

b **Error Type 2** — Windows 2000 is down and the system attempts to reset the board. If the reset fails, the board may be bad.

1 Replace the circuit pack.

c **Error Type 18** — The circuit pack has been busied out.

1 Release the board (**release board *UUCSS***).

d **Error Type 23 and 1025**: The MAPD-BD circuit pack is not completely administered.

To be fully administered, a MAPD circuit pack must:

- Have an entry in the circuit plan (**change circuit-pack**)
- Be administered (**add ds1 *UUCSS***)
- Be physically inserted into the correct slot

The MAPD circuit pack differs from others in that inserting it into the switch backplane is not enough to make the board usable.

e **Error Type 125, no Aux Data** — A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem:

- Remove the wrong circuit pack and insert the logically administered circuit pack

  or

- Re-administer the slot (**change circuit-pack**) to match the circuit pack inserted.

f **Error Type 257** — This error is associated with the Common Port circuit pack maintenance test. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for details.

g **Error Type 513** — Transient hardware problem, where Aux Data:

4352	External RAM failure
4353	Internal RAM failure
4355	Internal ROM failure

1. If the same Error Type/Aux Data value occurs more than once in a 24-hour period, the circuit pack should be replaced. See Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205 before removing the circuit pack.

If the MAPD board detects only one of these hardware problems, then the error is resolved when none of these faults are detected for 10 minutes.

h **Error Type 514** — LAN External RAM Error; hardware fault in the PPE external RAM, used for message buffering to and from the packet bus. This error should not occur regularly.

1. If this error occurs 10 times within 30 minutes, replace the circuit pack. See Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205 before removing the circuit pack.

i **Error Type 769** — Transmit FIFO Underflow (threshold is 3 errors within 10 minutes); the circuit pack cannot find the “end of frame” bit when transmitting a frame to the packet bus.

1. Clear the alarm using the following command sequence:
   a. busyout board *UUCSS*
   b. reset board *UUCSS*
   c. test board *UUCSS* long clear
   d. release board *UUCSS*
2. If the error recurs within 10 minutes, replace the circuit pack. See ‘‘Shutting Down Windows 2000 on the TN802’’ before removing the circuit pack.

j **Error Type 770** — Unable to Write LAN Translation RAM (threshold is 2 errors within 10 minutes); a call is aborted because there are no available translation RAM locations for the call connection attempt.

1. Clear the alarm using:
   a. busyout board *UUCSS*
   b. reset board *UUCSS*
   c. test board *UUCSS* long clear
   d. release board *UUCSS*
2. If the error recurs within 10 minutes, replace the circuit pack. See ‘‘Shutting Down Windows 2000 on the TN802’’ before removing the circuit pack.

k **Error Type 1537** — There was a LAN Bus Timeout because the circuit pack transmitted too many bytes on the LAN bus for a single frame. This condition may be caused by:

- an on-board fault
- faulty data received on one of the circuit pack’s external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those MOs.

If the error occurs 3 times within 10 minutes, the system raises the board alarm and isolates it from the packet bus.

1. Clear the alarm and restore the board to the packet bus:
   a. busyout board *UUCSS*
   b. reset board *UUCSS*
   c. test board *UUCSS* long clear
   d. release board *UUCSS*

2 If the problem persists, and there are no PKT-BUS alarms or port alarms, replace the circuit pack. See Shutting Down NT (S8100: Windows 2000) on the TN802 on page 1205 before removing the circuit pack.

l **Error Type 1538** — Hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

- The common circuit pack tests (for example, Test #50 and/or Test #52) abort with Error Code 2000.
- Port tests on this circuit pack return NO-BOARD.
- A busyout/release of the circuit pack has no effect on test results.
- A **list configuration** shows that the circuit pack and ports are properly installed.

The circuit pack is isolated from the system, and every trunk or port on this circuit pack is placed into the out-of-service state. The system attempts to restore the circuit pack within 20 – 30 minutes. When no faults are detected for 20 – 30 minutes, the MAPD Interface circuit pack is restored to normal operation, and every trunk or port on the MAPD Interface circuit pack returns to the in-service state.

1 If the board is not restored to normal operation or the error recurs after the board is restored to normal operation, escalate the problem.

m **Error Type 3073 – 3160** — Board is reporting slip errors. Aux Data shows the last reported slip count.

n **Error Type 3330** — LAN Critical error; critical failure in the packet-bus interface to the circuit pack. This failure may be due to an on-board or a packet-bus fault.

1 If the packet bus is alarmed, see PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 for repair procedures.

If the packet bus is not alarmed, clear this alarm and restore the board to the packet bus using:

a busyout board *UUCSS*

b reset board *UUCSS*

c test board *UUCSS* clear

d release board *UUCSS*

2 If the problem persists, and there are no PKT-BUS alarms, replace the circuit pack. See ‘‘Shutting Down Windows 2000 on the TN802’’ before removing the circuit pack.

o **Error Types 3585–3601** — The board received misframe errors. The Aux Data shows the last reported misframe count.

p **Error Type 3840** — The circuit pack received a bad control channel message from the switch. This error is not service-affecting, and requires no action. The Aux Data describes the following error events:

4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link

q **Error Type 3841** — The circuit pack detected a transient hardware logic error (for example, program logic inconsistency). This error resolves when no faults are detected for 100 minutes. The value in `Aux Data` field (4358) indicates the type of hardware problem.

r **Error Type 3842** — Bad Translation RAM Location Found error. The call continues by using another translation location. This error is not service-affecting and requires no action.

s **Error Type 3843** — LAN Receive Parity error. The circuit pack detected an error in a received frame from the packet bus. These errors are most likely caused by a packet-bus problem, but may be due to a circuit-pack fault.

1 Determine whether the problem is isolated to this circuit pack or the problem is caused by packet-bus faults (see the PKT-BUS MO).

t **Error Type 3999** — The circuit pack sent a large number of control-channel messages to the switch within a short period of time.

Error Type 1538 (hyperactivity) also present?	Then the switch:
Y	Takes the circuit pack out-of-service due to hyperactivity
N	Does not take the circuit pack out-of-service, but the circuit pack has generated 50% of the messages necessary to be considered hyperactive. This may be normal during heavy traffic periods.

Shutting Down NT (S8100: Windows 2000) on the TN802

Before removing the TN802 circuit pack from the carrier, shut Windows NT (**S8100**: Windows 2000) down first by following either procedure described in Table 520, Windows NT (S8100: Windows 2000) shutdown procedures, on page 1205:

Table 520: Windows NT (S8100: Windows 2000) shutdown procedures

Step	Faceplate button	PC interface
1	Push the recessed button on the front faceplate and hold it in.	Click on the **Start** button in the lower left corner.
2	“M shut” flashes on the LCD display	Click on **Shut Down**.
3	When shutdown is complete, “MSHUT #” displays (“#” is blinking).	Select the **Shut down the computer?** radio button.
4	Remove the circuit pack.	Click on **OK**.
5		Wait for the message indicating that shutdown is complete.
6		Remove the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented in Table 521, System Technician-Demanded Tests, on page 1206. For example, by clearing error codes associated with the NPE Connection Audit test (#50), you may also clear errors generated from other tests in the testing sequence.

Table 521: System Technician-Demanded Tests

Order of Investigation	Apply to TN802?[1]	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[2]
NPE Connection Audit test (#50)	Y		X		ND
Control Channel Loop test (#52)	Y		X		ND
Loss of Signal Alarm Inquiry test (#138)	N	X	X		ND
Blue Alarm Inquiry test (#139)	N	X	X		ND
Red Alarm Inquiry test (#140)	N	X	X		ND
Yellow Alarm Inquiry test (#141)	N	X	X		ND
Major Alarm Inquiry test (#142)	N	X	X		ND
Minor Alarm Inquiry test (#143)	N	X	X		ND
Slip Alarm Inquiry test (#144)	N	X	X		ND
Misframe Alarm Inquiry test (#145)	N	X	X		ND
Translation Update test (#146)	N	X	X		ND
SAKI Sanity test (#53)	Y			X	D

1 N = No; this test either passes or ABORTS with Error Code 2000 (problem with NT)

2 D = Destructive; ND = Nondestructive

NPE Connection Audit Test (#50)

The system sends the circuit pack's on-board microprocessor a message to update the network-connectivity translation for its SCOTCH-NPE chip.

Table 522: Test #50 NPE Connection Audit Test *1 of 2*

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1019	ABORT	The test aborted because a test was already running on the port. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 522: Test #50 NPE Connection Audit Test *2 of 2*

Error Code	Test Result	Description / Recommendation
	PASS	The circuit pack's SCOTCH-NPE chip has been updated with its translation.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Execute **add ds1 *UUCSS*** to administer the MAPD interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be correctly inserted in Step 1, then issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

2 of 2

Control Channel Loop-Around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage and verifies its records.

Table 523: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The circuit pack failed to return the circuit pack code or vintage. **1** Retry the command up to 5 times. **2** If the problem continues, and if the circuit pack is one of the Port circuit packs, replace the circuit pack. **3** Otherwise, if the circuit pack is part of the SPE, use the procedure described in Reseating and replacing circuit packs in *Maintenance Procedures (555-245-103)*.
	PASS	Communication with this circuit pack is successful.

1 of 2

Table 523: Test #52 Control Channel Loop-Around Test *Continued*

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Execute **add ds1 *UUCSS*** to administer the MAPD interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be inserted correctly, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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SAKI Sanity Test (#53)

This test is **destructive**.

This test resets the circuit pack. The test is highly destructive and can only be initiated by a system technician-demanded **reset board *UUCSS*** command.

Table 524: Test #53 SAKI Sanity Test *1 of 2*

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry **reset board** at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack (**busyout board *UUCSS***). **2** Execute **reset board**.
2100	ABORT	System resources required for this test are not available. **1** Retry **reset board** at 1-minute intervals up to 5 times.
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. **1** Execute **reset board**. **2** If the problem persists, replace the circuit pack.

1 of 2

Table 524: Test #53 SAKI Sanity Test *2 of 2*

Error Code	Test Result	Description / Recommendation
	PASS	The circuit pack initializes correctly. **1** Run the short test sequence.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Use **add ds1** ***UUCSS*** to administer the MAPD interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was inserted correctly, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Loss of Signal Alarm Inquiry Test (#138)

This test is meaningless for the TN802 MAPD circuit pack.

Table 525: Loss of Signal Inquiry Test (#138) results

Windows 2000 up on the TN802?	Then	Cause
Y	Test passes	
Y	Test aborts with ABORT 2000 Error Code.	Windows 2000 is not communicating with the angel firmware.
N	Test aborts with ABORT 2000 Error Code.	Windows 2000 down.

Blue Alarm Inquiry Test (#139)

This test is meaningless for the TN802 MAPD circuit pack.

Table 526: Blue Alarm Inquiry Test (#139) results

Windows 2000 up on the TN802?	Then	Cause
Y	Test passes	
Y	Test aborts with ABORT 2000 Error Code.	Windows 2000 is not communicating with the angel firmware.
N	Test aborts with ABORT 2000 Error Code.	Windows 2000 down.

Red Alarm Inquiry Test (#140)

This test is meaningless for the TN802 MAPD circuit pack.

Table 527: Red Alarm Inquiry Test (#140) results

If Windows 2000 is up on the TN802	When the switch confirms Red alarm:
Y	Test passes
N	Test aborts with ABORT 2000 Error Code.

Yellow Alarm Inquiry Test (#141)

This test is meaningless for the TN802 MAPD circuit pack.

Table 528: Yellow Alarm Inquiry Test (#141) results

If Windows 2000 is up on the TN802	When the switch confirms Yellow alarm:
Y	Test passes
N	Test aborts with ABORT 2000 Error Code.

Major Alarm Inquiry Test (#142)

This test is meaningless for the TN802 MAPD circuit pack.

Table 529: Major Alarm Inquiry Test (#142) results

If Windows 2000 is up on the TN802	When the switch confirms Major alarm:
Y	Test passes
N	Test aborts with ABORT 2000 Error Code.

Minor Alarm Inquiry Test (#143)

This test is meaningless for the TN802 MAPD circuit pack.

Table 530: Minor Alarm Inquiry Test (#142) results

If Windows 2000 is up on the TN802	When the switch confirms Minor alarm:
Y	Test passes
N	Test aborts with ABORT 2000 Error Code.

Slip Alarm Inquiry Test (#144)

This test is meaningless for the TN802 MAPD circuit pack.

NOTE:
The query for slips always returns a 0 count.

Table 531: Slip Alarm Inquiry Test (#144) results

If Windows 2000 is up on the TN802	When the switch confirms Slip alarm:
Y	Test passes
N	Test aborts with ABORT 2000 Error Code.

Misframe Alarm Inquiry Test (#145)

This test is meaningless for the TN802 MAPD circuit pack.

NOTE:
The query for misframes always returns a 0 count.

Table 532: Misframe Alarm Inquiry Test (#145) results

If Windows 2000 is up on the TN802	When the switch confirms Misframe alarm:
Y	Test passes
N	Test aborts with ABORT 2000 Error Code.

Translation Update Test (#146)

The Translation Update test sends the circuit pack-level information to the MAPD Interface circuit pack. Translation includes the following data administered for a MAPD Interface circuit pack (report from **display ds1 *UUCSS***):

- DS1 Link Length between two DS1 endpoints
- Synchronization Source Control
- All Zero Suppression
- Framing Mode
- Signaling Mode
- Time Slot Number of the 697-Hz tone
- Time Slot Number of the 700-Hz tone

Table 533: Test #146 Translation Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system software error. **1** Verify the MAPD Interface circuit pack translation (**display ds1 *UUCSS***).
	PASS	Translation data has been downloaded to the MAPD Interface circuit pack successfully.

1 of 2

Table 533: Test #146 Translation Update Test *Continued*

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Use **add ds1 *UUCSS*** to administer the MAPD interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be inserted correctly, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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MEDPRO (Media Processor MAPD Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MEDPRO	MAJOR	**test board *location* sh**	Media Processor MAPD circuit pack
MEDPRO	MINOR	**test board *location* l**	Media Processor MAPD circuit pack
MEDPRO	WARNING	**test board *location* sh**	Media Processor MAPD circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN802B MedPro circuit board provides voice over IP connectivity. The TN802B can run either the:

- R8.1 IP Trunk application — Allows the TN802B to emulate a DS1 circuit pack. In this mode, the circuit pack is maintained as a standard DS1 board with its associated Tie trunk ports. The TN802B operates as an integrated Internet Telephony server (ITS). It communicates with other ITS boxes or IP trunk boards.
- Media Processor (MedPro) application — Allows the TN802B to act as a service circuit to terminate generic RTP streams used to carry packetized audio over an IP network. As part of the overall H.323 implementation, the TN802B or later circuit pack handles the audio streams while the TN799DP C-LAN handles the TCP/IP signaling channels. This maintenance plan applies only to a TN802B MedPro running the Media Processor application.

The MedPro hardware combines an angel complex, a Windows 2000 PC and a TAP802 DSP card in a 3-slot package. When operating as an IP trunk circuit pack, the MedPro emulates a DS1 Tie Trunk circuit pack and blindly responds to DS1 trunk maintenance requests. Actual maintenance is accomplished via the Windows 2000 interface and the ITS software diagnostics.

The Media Processor application is built upon the existing ITS software, and as such is not administered in Communication Manager as a DS1 trunk, and does not emulate a DS1 for maintenance purposes. Use the following Maintenance procedures for this application.

Error Log Entries and Test to Clear Values

Table 534: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board *UUCSS***
1 (a)	0	Circuit pack removed or SAKI test (#53)	MINOR WARNING[2]	ON	
18 (b)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board *UUCSS***
23 (c)	0		WARNING	OFF	**add ds1 *UUCSS***
125 (d)	None	None	MINOR WARNING[3]	ON	
257 (e)	65535	Control Channel Loop test (#52)	MINOR	ON	**test board *UUCSS* l r 2**
1538 (f)	Any	Hyper activity	MINOR WARNING[3]	ON	
1793	Any	NIC Loss Of Signal	MINOR WARNING[3]		**test board *UUCSS* l r 2**
2049 (g)	Any	NT PC Failure	MINOR WARNING[3]		**reset board *UUCSS***
2305	Any	IP Address Inconsistency			**test board *UUCSS* l r 2**
2561	Any	Ping Error	MINOR WARNING[3]		**test board *UUCSS* l r 5**
3841 (h)	4358		Log Only		
3999 (i)	Any	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.

3 Minor alarms on this MO may be downgraded to warning based on values in **set options**.

Error Notes:

a **Error Type 1** — Indicates that the circuit pack has totally stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11-minutes after the SAKI test (#53) fails.

To be fully administered, a MedPro circuit pack must:

- Have an entry in the circuit pack screen (**change circuit-pack**)
- Have the MedPro IP address administered (**change node-names**)
- Be enabled (**change ipserver-interface**)
- Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit pack screen and the other conditions are not met, a MINOR alarm is logged. To resolve the error:

- Make sure every condition for administration is met and that a functioning MedPro circuit pack is inserted in the correct slot.

  or

- Completely remove the MedPro from the system using the following steps:

  1 Remove the administered IP-Interface associated with the circuit pack.

  2 Physically remove the circuit pack from the slot.

  3 Execute **remove medpro *UUCSS*** and **change circuit-pack *UUCSS***.

b **Error Type 18** — The MedPro Interface circuit pack has been busied out by **busyout board *UUCSS***.

1 Release the circuit pack (**release board *UUCSS***).

c **Error Type 23** — The MedPro circuit pack is not completely administered.

To be fully administered, a MedPro circuit pack must:

- Have an entry in the circuit pack screen (**change circuit-pack**)
- Have the MedPro IP address administered (**change node-names**)
- Be enabled (**change ipserver-interface**)
- Be physically inserted into the correct slot

A DS1 (MEDPRO, MAPD, UDS1-BD and DS1-BD) differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered.

d **Error Type 125** — No Aux Data: The wrong circuit pack is inserted in the slot where this circuit pack is logically administered.

- Remove the wrong circuit pack and insert the logically administered circuit pack

  or

- Re-administer this slot to match the circuit pack inserted (**change circuit-pack**).

e **Error Type 257** — Associated with the Common Port circuit pack maintenance test. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for details.

f **Error Type 1538** — Indicates hyperactivity on a circuit pack. Hyperactivity occurs when the angel is sending too many CCMS messages uplink, 400 per ten seconds for the TN802B, to switch software. The circuit pack will be taken out of service. See error Type 3999.

g **Error Type 2049** — Indicates that the operating system is down. An attempt is made to reset the board automatically. If the reset fails, the board is probably bad and should be replaced.

h **Error Type 3841** — Inconsistent downlink message. This error is not service-affecting. No action is required.

i **Error Type 3999** — Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time.

If Error Type 1538 is also present, the circuit pack was taken out-of-service due to hyperactivity.

If Error Type 1538 is absent, the circuit pack has generated 50% of the messages necessary to be considered hyperactive but was not taken out-of-service. This may be completely normal during heavy traffic periods.

If this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented. For example, by clearing error codes associated with the *Control Channel Loop test (#52)*, you may also clear errors generated from other tests in the testing sequence.

Table 535: System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Control Channel Loop test (#52)		X		ND
SAKI Sanity test (#53)			X	D
IP Address Query (#1371)	X	X		D
NIC Query test (#1383)	X	X		ND
PING test (#1379)	X	X		ND
Windows 2000 Reset test (#1381)			X	D

1 D = Destructive; ND = Nondestructive

Control Channel Loop-Around Test (#52)

This test queries the circuit pack for its circuit pack code and vintage, and verifies its records.

Table 536: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The circuit pack failed to return the circuit pack code or vintage. **1** Retry the command up to 5 times. **2** If the problem continues, and if the circuit pack is one of the Port circuit packs, replace the circuit pack. **3** Retry the command up to 5 times.
	PASS	Communication with this circuit pack is successful.

Table 536: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Administer the MedPro interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be inserted correctly, issue **busyout board *UUCSS***. **4** Issue the **reset board *UUCSS*** command. **5** Issue the **release board *UUCSS*** command. **6** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

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SAKI Sanity Test (#53)

This test is **destructive**.

This test is only run as a part of a reset board procedure. For the Media Processor, use **change ipserver-interfaces** to disable the Media Processor IP interface before performing this reset board procedure. Use **reset board *UUCSS*** to reset other common circuit packs, and to also execute this test.

A reset of this circuit pack will take about 3½ minutes.

Table 537: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack. **2** Execute command again.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2803	ABORT	It is necessary to reset the board. **1** Use **change ipserver-interfaces** to disable the Media Processor IP interface. **2** Execute the command again.

1 of 2

Table 537: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. **1** Execute command again. **2** If the problem persists, replace the circuit pack.
	PASS	The circuit pack initializes correctly. **1** Run the short test sequence.
Any	NO BOARD	This is normal if the test is being done when the board is not physically in the system or when the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals up to 5 times.

2 of 2

IP Address Query Test #1371

This test is **destructive**.

A Media Processor has two administration interfaces:

- the SAT interface using CCMS messages
- the Windows 2000 PC interface

However, the Windows 2000 PC interface allows changes that cause the Media Processor board to be inconsistent with Communication Manager translations (including the IP address, subnet mask, and gateway translation).

This test causes the Communication Manager software to send its IP address, subnet mask, and gateway translation (IP parameters) to the Media Processor. If these parameters do not match MedPro's values in its Windows registry, the parameter values are written into the registry, and the Windows 2000 PC on the board asks the maintenance sub-system to reboot the board. The board goes through a logical board removal and insertion.

When this test fails, it is an indication that an illegal change was made and the customer should be notified. Also, writing the IP address parameters to the registry requires Windows 2000 on the board to reboot.

If the IP addresses match, there is no need to update the registry or reboot Windows 2000.

Table 538: Test #1371 IP Address Query Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Insufficient system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2801	ABORT	Unable to find IP address data for this location. Verify that the board is administered.
2807	ABORT	The board is administered, but not enabled in **change ipserver-interfaces**.
	FAIL	The IP address, subnet mask, and gateway translation parameters in the Communication Manager software and on the MedPro board do not match. After the new values are written into the board's Windows registry, the Windows 2000 PC on the board must go through a reboot. The board goes through a logical board removal and insertion. **1** If the problem persists, replace the circuit pack.
	PASS	Communication Manager translation data matches MedPro's Windows registry.

Ping Test (#1379)

This test is **non**destructive.

This test verifies that the MedPro circuit pack can communicate to other nodes on the LAN.

This test pings the gateway IP address as defined on the IP Interface screen.

If the PING is successful, this test looks at the PING round trip delay. If a round trip delay of greater than 4 seconds is reported, a separate error is logged. Excessive round trip delays do not take the MedPro out of service.

Services can execute the standard **ping** command using the C-LAN board address and MedPro IP address to see the actual round-trip delay. (See ''ping'' commands).

This test is a nondestructive test. It runs because of in-line errors, during periodic and schedule maintenance, and on demand.

Table 539: Test #1379 Ping Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Internal Error.
2		**1** Retry the command at 1-minute intervals up to 3 times.
7	ABORT	Destination unreachable.
		1 Verify that at least one destination reachable through this port is up.
		2 Repeat the test.
		3 If the test still aborts, escalate the problem.
2000	ABORT	Response to the test was not received from the Media Processor circuit pack within the allowable time period.
		1 If this result occurs repeatedly, attempt to reset the circuit pack. Reset the circuit pack by issuing **busyout board *UUCSS*** and **reset board *UUCSS***.
		2 If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error.
		1 Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	The necessary system resources to execute the test could not be allocated.
		1 Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error.
		1 Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	No IP address defined. Verify IP Interfaces translations and retest.
2802	ABORT	Different IP address pinged than software had allocated for the test.
		1 Retry the command at 1-minute intervals up to 3 times.
2805	FAIL	The number of pings received did not match the number sent (normally one ping sent). This means that no ping responses were received from the gateway defined on the ip-interfaces screen for the Media Processor.
		1 Retry the command at 1-minute intervals up to 3 times.
2807	ABORT	The board is administered, but not enabled in **change ipserver-interfaces**.
7	FAIL	Ping to the destination failed through this port due to the destination down.
89		**1** Verify that at least one destination reachable through this port is up.
1007		**2** Once verified, use **test port *UUCSSpp*** to verify that the H.323 Signaling Group Ping test (#1387) passes.
	PASS	Ping through this port successful.

Windows 2000 Reset Test (#1381)

This test is **destructive**.

This test resets the circuit pack. The test is highly destructive and can be initiated only by a system technician-demanded **reset board *UUCSS***.

Table 540: Test #1381 NT Reset Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry **reset board *UUCSS*** at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack (**busyout board *UUCSS***). **2** Execute **reset board *UUCSS***.
2100	ABORT	System resources required for this test are not available. **1** Retry **reset board *UUCSS*** at 1-minute intervals up to 5 times.
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. **1** Execute **reset board *UUCSS***. **2** If the problem persists, replace the circuit pack.
	PASS	The circuit pack initializes correctly. **1** Run the short test sequence.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Administer the MEDPRO interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be inserted correctly, issue **busyout board *UUCSS***. **4** Issue the **reset board *UUCSS*** command. **5** Issue the **release board *UUCSS*** command. **6** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

NIC Query Test (#1383)

This test is **non**destructive.

This test passes if the Ethernet port is connected, and you can talk on the network. Otherwise, it fails with no fail code or AUX data.

Table 541: Test #1383 NIC Query Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack (**busyout board *UUCSS***). **2** Execute the command again.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Ethernet port is not connected, and you cannot talk on the network.
	PASS	The Ethernet port is connected, and you can talk on the network.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Administer the MedPro interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be inserted correctly, issue **busyout board *UUCSS***. **4** Issue the **reset board *UUCSS*** command. **5** Issue the **release board *UUCSS*** command. **6** Issue the **test board *UUCSS* long** command. This should re-establish the linkage between the internal ID and the port.

MEDPROPT (TN802/TN2302 MED PRO DSP PORT)

S8700 / S8500 S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
MEDPROPT	MINOR WARNING	**test port *location*[1] | *location* [short/long] [repeat#] | [clear]**	TN802/TN2302 MEDPRO DSP PORT

1 For information on specifying a ***location***, see Command Syntax on page 179.

The MEDPROPT MO monitors the health of the MEDPRO digital signal processors (DSPs).

The TN802B/TN2302 MAP-D (Multi-Application Platform for DEFINITY) Media Processor circuit pack provides the audio bearer channels for H.323 voice over IP calls. One TN802B circuit pack has one MEDPROPT media processing resource. One TN2302AP has 8 ports, each with a MEDPROPT media processing resource.

Based on system administration of audio codecs, a MEDPROPT can handle multiple simultaneous channels of H.323 audio processing. The TN2302AP can handle up to 64 channels, based on codec type. If the **ip-parameters** screen specifies only G.711 mu-law or G.711 a-law as the audio codecs, the MEDPROPT can service 31 channels. If any other codec type (G.723-5.3K, G.723-6.3K, or G.729) is administered, the MEDPROPT can only service 22 channels.

The MEDPROPT is physically made up of 11 individual DSPs, but is treated logically as one port. If individual DSPs on the TN802B/TN2302 MAPD fail, the MEDPROPT remains in-service at lower capacity.

The MEDPROPT is a shared service circuit. It is shared between H.323 trunk channels and H.323 stations. An idle channel is allocated to an H.323 trunk/station on a call-by-call basis.

Error Log Entries and Test to Clear Values

Table 542: MEDPROPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board *UUCCSS*
1 (a)	Any	DSP Capacity test (#1382)		ON	test board *UUCCSS* long repeat 5
18 (b)	0	busyout port UUCSS	WARNG	OFF	release port *UUCCSS*
258 (c)	Any	DSP Capacity test (#1382)	WARNG	ON	test board *UUCCSS* long repeat 5
513 (d)		DSP Capacity test (#1382)	MINOR	ON	test port *UUCCSSpp*
515 (e)	Any	DSP Capacity Query test (#1382)	MINOR	ON	test board *UUCCSS* long repeat 5

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Table 542: MEDPROPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
769	Any	TDM NIC Loop-Around test (#1380)	MINOR	ON	test port *UUCCSS* long repeat 10
1025 (f)	Any				

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Error Notes:

a **Error Type 1** — For the TN802B only, this error type indicates that less than three DSPs are OOS (out of service), and no alarm is raised. The `Aux Data` field contains the number of DSPs that are OOS.

b **Error Type 18** — the MEDPRO has been busied out by **busyout port *UUCSS***.

1 Release the port (**release port *UUCSS***).

c **Error Type 258** — For the TN802B only, this error type indicates that more than three, but less than 9 DSPs are OOS (out of service), and a WARNING alarm is raised. The `Aux Data` field contains the number of DSPs that are OOS.

d **Error Type 513** — For the TN2302 only, the port is OOS (out of service) because an associated DSP is bad.

e **Error Type 515** — For the TN802B only, this error type indicates that every DSP is OOS (out of service), and a MINOR alarm is raised. The `Aux Data` field contains the number of DSPs that are OOS.

f **Error Type 1025** — The port is OOS (out of service) because of a board-level failure. Check for errors/alarms against the board, in particular ping problems, IP address inconsistency, or board sanity problems.

1 Verify correct administration.

2 Check cabling and customer network before replacing circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented in Table 543, System Technician-Demanded Tests, on page 1226. By clearing error codes associated with the *DSP Capacity Query test (#1382)*, you may also clear errors generated from the other tests in the testing sequence.

Table 543: System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	S8100: Reset Board Sequence	S8100: test ds1-loop	D/ND[1]
DSP Capacity Query test (#1382)	S8100: X	X			ND
TDM NIC Loop-Around test (#1380)	S8100: X	X			ND
Port Status test (#1407)	X	X	ND	X	ND

1 D = Destructive; ND = Nondestructive

DSP Capacity Query Test (#1382)

This test is **non**destructive.

S8100 / G600

For the TN802B

When using theTN802B, this test polls the circuit pack for the number of failed DSPs. If every DSP is functional, the test passes and the board is operating at maximum capacity. If any DSPs have failed, the test fails and reports the number of failed DSPs.

A failure of 3 or fewer DSPs does not result in an alarm. A failure of more than 3 and up to 8 DSPs results in a warning alarm. A failure of more than 8 DSPs results in a minor alarm. In all cases, except when every DSP fails, the MEDPROPT continues to provide reduced capacity.

For the TN2302

When using the TN2302 this test polls the circuit pack for the state of health of a specific DSP. If the DSP is bad, an error will be logged and the board will be polled again. If the circuit pack is still failing, the DSP will be taken out of service and a MINOR alarm will be raised.

Table 544: DSP Capacity Query Test (#1382)

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 544: DSP Capacity Query Test (#1382)

Error Code	Test Result	Description / Recommendation
1–11	FAIL	Some DSPs on the circuit pack have failed. The FAIL code is the number of bad DSPs reported (**S8100 / G600:** TN802B only).
	FAIL	For the TN2302 only, the DSP failed. If it continues to fail, it will be taken out of service.
	PASS	All 11 DSPs are functioning and in-service.
0	NO BOARD	No board was detected by the test. **1** Check the Error Log for wrong board (Error Type 125) or no board (Error Type 131). Resolve either of these issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity. If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the circuit pack may be bad. Replace the circuit pack and retest.

2 of 2

TDM NIC Loop-Around Test (#1380)

This test is **non**destructive.

This test sets up a loop-back path from the TDM bus out to the NIC edge of the Media Processor and back to the TDM bus. The loop back is established by setting up the outbound IP connection to send IP packets to the MedPro's own IP address. The tone generator places a test tone (440Hz) onto a timeslot. The timeslot is listened to by the Media Processor board. The tone is routed through the TAP802/2302 DSP farm, where it may undergo transcoding to G.723, etc. The tone is looped back at the Network interface and back through the TAP802/2302 where it is converted back into standard PCM. The tone is placed onto a TDM timeslot and detected by a tone detector port. The test passes if 440Hz is reported by the tone detector.

Table 545: TDM NIC Loop-Around Test (#1380)

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions, or it may have timeslots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times. **2** If the system has TDM-BUS errors, clear any errors, and retry the command at 1-minute intervals up to 3 times. **3** If the command continues to abort, escalate the problem.

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Table 545: TDM NIC Loop-Around Test (#1380)

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out of service. **1** Resolve any TTR-LEV errors. Even if there are no TTR-LEV errors, there may not be a Tone Detector available on the network that contains the circuit pack being tested. Verify that there is at least one Tone Detector on this network. This does not harm the system. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
2801	ABORT	The TN802B/TN2302 Media Processor board has not been administered on the **ipserver-interfaces** screen.
ANY	FAIL	The test did not detect the test tone through the looparound connection. **1** Test the tone-clock in the port network that contains the media processor under test. **2** If the tone-clock is healthy, test the media processor board again. **3** If the test continues to fail, replace the media processor board.
	PASS	The board is functioning properly.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, the NCE chip on board may be bad. Replace the board and retest.

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Port Status Query Test (#1407)

This test is **non**destructive.

This test queries the Port status.

Table 546: port Status Query Test (#1407)

Error Code	Test Result	Description / Recommendation
1	ABORT	This port is Out of service (OOS) due to: • A board-level problem, for example no IP address has been translated for this location. • A DSP hardware problem (see TDM NIC Loop-Around Test (#1380) on page 1227 and DSP Capacity Query Test (#1382) on page 1226).
2	ABORT	This port has been made maintenance busy
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions, or it may have timeslots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 3 times. **2** If the system has TDM-BUS errors, clear any errors, and retry the command at 1-minute intervals up to 3 times. **3** If the command continues to abort, escalate the problem.
2000	ABORT	Response to the test was not received in the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	Unable to get status for this port. Verify that this board has been administered correctly, and that there are no alarms against this board.
	PASS	The board is functioning properly and the port is in-service and available.
0	NO BOARD	No board was detected by the test. **1** Resolve either wrong board (Error 125) or no board (Error 131) issues, if applicable. **2** Check that the board is properly translated and inserted. If so, check for hyperactivity (Error 1538). If hyperactive, use **reset board *UUCSS***. **3** Run the test again. If it fails, replace the board and retest.

MET-BD (MET Line Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MET-BD	MINOR	**test board *location* sh**	MET Line circuit pack
MET-BD	WARNING	**test board *location* sh**	MET Line circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also MET-LINE (MET Line) Maintenance documentation for related line information.

MET-LINE (MET Line)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MET-LINE	MINOR	**test port *location* l**	MET Line
MET-LINE	WARNING	**test port *location* sh**	MET Line

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN735 MET Line circuit pack supports four Multibutton Electronic Telephone (MET) station sets. Each MET set uses three pairs of wires: an analog voice pair, a transmit pair, and a receive pair. Power is sent over the transmit and receive pairs. The MET Line circuit pack supports every 10-, 20-, and 30-button set.

This section describes MET-LINE (MET Line) maintenance. MET-LINE maintenance is closely related to, and interacts with, MET-BD (MET Line circuit pack) maintenance. This interaction should be kept in mind when troubleshooting MET Line problems.

This section occasionally refers to a station's *service states*. The service states are defined as follows:

Out-of-Service	The port, and thus the station, have been removed from service. A busyout of a port will cause it to be out-of-service.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally, but it can also be forced into the in-service state if it goes off-hook.

Use **status station** to determine terminal service state. Status is reported as out-of-service, in-service, or disconnect, which means the station is in the ready-for-service state.

Error Log Entries and Test to Clear Values

Table 547: MET Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port *UUCSSpp* sh r 1
1 (a)	40987	None			
18 (b)	0	busyout port UUCSSpp	WARNING	OFF	release port *UUCSSpp*
130 (c)		None	WARNING	ON	test port *UUCSSpp* sh
257 (d)	40988	None	MINOR WARNING[2]	OFF	
513 (e)	40965	Hybrid Line Station Audits test (#61)	WARNING	OFF	test port *UUCSSpp* sh r 4
769		Port Diagnostic test (#35)	MINOR WARNING[2]	ON	test port *UUCSSpp* l r 3
1025		Hybrid and Conf. Circuits test (#57)	MINOR WARNING[2]	ON	test port *UUCSSpp* l r 3
1537 (f)	40968	None	MINOR WARNING[2]	OFF	
1793		TDM NPE Crosstalk test (#6)	MINOR WARNING[2]	ON	test port *UUCSSpp* l r 3
2049 (g)	32770				
2049 (h)	40967				
3840 (i)	40989				

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 Major or Minor alarms MO may be downgraded to Warning based on the values in **set options**.

Error Notes:

a The data link between the port and the terminal is not operational (i.e., the port circuitry has detected an off-board problem). Verify that the MET set is connected and that the EPF (Electronic Power Feed) test passes. If data transmission problems are experienced, check for defective wiring or a defective voice terminal, or move terminal electrically closer to the switch (i.e., reduce the length of the wiring between the terminal and the switch). If the problem persists, replace the circuit pack. Once the problem is resolved, the system retires the alarm after a predetermined time delay.

b Error type 18 is logged when maintenance personnel busyout the port. The port is released from busyout via **release port *UUCSSpp***.

c The circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d The EPF has been turned off due to an overcurrent condition at the voice terminal. Check for defective wiring or a damaged jack, and verify that the voice terminal is an MET set. Once the problem is resolved, the system retires the alarm after a predetermined time delay.

e The EPF inquiry audit has returned "epf-no-load" messages. This usually indicates that the voice terminal has been disconnected or that there is a defect in the wiring to the terminal. Check out both possibilities.

When the EPF inquiry audit subsequently receives an "epf-on-ok" or an "epf-off-ok" message, the system will take action to retire the alarm.

f The port has reported a problem with the data link to the voice terminal. Ignore this error if there are no complaints about the voice terminal. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and decrease the length of the wiring between the voice terminal and the switch. If the problem persists, replace the circuit pack.

g The voice terminal went off-hook while it was in the ready-for-service state. Use **status station** to determine the state of the voice terminal. The off-hook should have moved the station to in-service. No repair action is necessary.

h This code is generated when the link between the circuit pack and the voice terminal is successfully reset. No repair action is necessary.

i The hardware sent an uplink message indicating that the Electric Power Feed (EPF) is not loaded, that is, it is not currently supplying power to a voice terminal. No repair action is necessary.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Port Diagnostic test (#35), you may also clear errors generated from other tests in the testing sequence.

Table 548: System Technician-Demanded Tests: MET-LINE

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6)		X	ND
Port Diagnostic test (#35)		X	ND
MFAT Electronic Power Feed test (#56)		X	ND
Hybrid Circuit and Conference Circuit test (#57)		X	ND
Station Lamp Update test (#60)	X	X	ND
Station Audits test (#61)	X	X	ND
Ringer Update test (#62)	X	X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is part of a port's long test sequence and takes about 20 to 30 seconds to complete.

Table 549: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled by administration. This only applies to analog stations. The default for this field is **y**, so you may want to determine why it was turned off on this station. **1** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the `Test` field on the Station screen to **y**.

1 of 2

Table 549: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2100	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	This test can fail due to on-board or off-board problems. Off-board problems of concern include EXP-PN, EXP-INTF, or RMC-ENV faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear every off-board problem before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. **1** Resolve any EXP-PN, EXP-INTF, or RMC-ENV errors. **2** Resolve any TDM-BUS errors. **3** Resolve any TONE-BD and/or TONE-PT errors. **4** Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port uses its allocated time slots correctly. Investigate user-reported troubles on this port using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config** and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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Port Diagnostic Test (#35)

This test checks a port's battery feed circuitry. The battery feed circuitry is tested for proper battery voltage by testing the switchhook state. In response to the test message, the on-board firmware terminates the line and checks for switch-hook presence. The termination is then removed, and a check is made for no switch-hook presence. The MET set must be on-hook for the test to execute.

Table 550: Test #35 Port Diagnostic Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. The battery feed circuitry is tested for proper battery voltage by testing the switchhook state. In response to the test message, the on-board firmware terminates the line and checks for switch-hook presence. The termination is then removed, and a check is made for no switch-hook presence. The MET set must be on-hook for the test to execute. **1** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1018	ABORT	Test disabled by software patch.
2000	ABORT	This port may have been busied out. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via **release station *extension*** and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Battery Feed test failed. This port is out-of-service. **1** Other ports on this circuit pack are not affected. Place user on a different port, if available, until a replacement circuit pack can be obtained. **2** Replace circuit pack when available.

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Table 550: Test #35 Port Diagnostic Test

Error Code	Test Result	Description / Recommendation
	PASS	Battery Feed test passed. Current flow is properly detected for this port. **1** If users are reporting problems, examine connections to the port.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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MFAT Electronic Power Feed (#56)

The software requests that the EPF be turned on for a given port. The hardware then attempts to turn on that port's station power unit. If no current is drawn, the station is probably not connected. If an overcurrent condition is sensed (too much current is drawn), a short may exist in the loop, or the voice terminal may be defective. The test results in a message indicating that either the EPF was turned on successfully with no problems, or an overcurrent condition exists. This test is repeated after a 5 second delay. If either test is not successful, the test aborts. Although this test will never actually return a fail result (except for the internal system error), an error type 257 entry will be made in the error log when the test has completed if the overcurrent case is detected by the hardware.

Table 551: Test #56 MFAT Electronic Power Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	The test was aborted due to an internal system error on a software request to the board. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
	FAIL	The test failed with an internal error while it was attempting to turn on the EPF. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 551: Test #56 MFAT Electronic Power Feed Test

Error Code	Test Result	Description / Recommendation
	PASS	Electronic Power Feed test passed. The message to turn on the power to the station was successfully sent to the port. **1** Although this test will never actually return a FAIL result except for the **Internal system error** described above, it will log an error if the overcurrent case is detected by the hardware. Check the Error Log for any entries with Error Type 257 when the test has completed. **2** If Error Type 257 does not appear in the Error Log within 10 seconds after completion of this test, it is safe to assume that the test sensed no problems with the power to the station. You can verify that the station is powered up correctly by executing a self-test on the station, and checking that every feature button is operating. **3** The appearance of Error Type 257 in the Error Log indicates a station power problem. Check for a wiring short, a damaged jack, a defective voice terminal, or an incorrect type of terminal.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config** and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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MET Circuit and Conference Circuit Test (#57)

This test checks two different port circuit functions. The Hybrid Circuit test performs an analog reflective loop-around measurement on the port's hybrid circuitry. The Conference Circuit test performs a conference test on the port's NPE.

For Hybrid Circuit test results to be valid, a voice terminal must be connected to the port being tested. The test instructs the on-board microprocessor to put the port in analog reflective loop-around mode. The Tone-Clock circuit pack supplies a 1004-Hz tone to the port's listen time slot and a GPTD (General-Purpose Tone Detector) measures the level of the reflected signal appearing on port's talk time slot.

The Conference test is performed only if the Hybrid Circuit test passes. The Conference Circuit test verifies that the Network Processing Element (NPE) can correctly conference several test tones together. The test is executed in two parts. The first half of the test verifies operation of the NPE's first three conference channels, and the second half verifies the NPE's remaining four conference channels. The test puts the NPE in loop-around mode and instructs it to talk on a specified time slot while listening to a 1004-Hz tone using the Conference Channels. A GPTD then measures the signal and noise levels of the conferenced output and reports whether or not these fall within a specified acceptable range.

Table 552: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before retesting. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test were not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 552: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
7	FAIL	The conference circuit test failed. The conference circuit test is performed only if the hybrid test passes. The conference circuit test verifies that the network processing element (NPE) can correctly conference several test tones together. The test is executed in two parts. The first half of the test verifies the operation of the NPE's first three conference channels, while the second half verifies the NPE's remaining four conference channels. The test puts the NPE in loop around mode and instructs it to talk on a specified time slot while listening to a 1004-Hz tone, using the conference channels. A GPTD then measures the signal and noise levels of the conferenced output and reports whether or not these are within an acceptable range. The failure may be due to off-board circumstances, the most common of which is an off-hook occurring during the test. It is possible that the port may still be functional from a user's point of view. Also, check the error logs against the GPTD-BD, the TONE-BD, and the TONE-PT. **1** This error can be caused by a disconnected terminal. First, ensure that the terminal is connected and the wiring is OK. **2** Then, issue **display port** and **station status** to determine whether the station is idle. If so, issue **test port** for this port. **3** If test continues to fail, issue **busyout port** and **release port**, and retest the port.
57	FAIL	Hybrid Circuit test failed. This can result in noisy or bad connections. **1** Run circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack, using **test board *UUCSS* short**. **2** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. **3** If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the MET Line circuit pack. If the Hybrid Circuit and Conference Circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. To investigate problems with a power unit, see RMC-ENV (Power/Fan Sensors) on page 1593, or CARR-POW (Carrier Power Supply) on page 578.

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Table 552: Test #57 Hybrid Circuit and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	PASS	Hybrid Circuit and Conference Circuit test passed. The hybrid circuitry is transmitting properly. **1** If complaints persist, investigate by using other port tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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MET Line Station Lamp Updates Test (#60)

For this test, the software lights the lamps on the terminal based on the status record contained in the processor. The lamp updates run only if the station is in-service.

Table 553: Test #60 MET Line Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
1	ABORT	This port may have been busied out. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port via **release station *extension*** and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
2	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	Station is in ready-for-service or out-of-service state. This may be due to wiring or an unplugged or defective set. **1** Make sure terminal is connected and the wiring is correct. **2** Retry the command at 1-minute intervals up to 5 times.

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Table 553: Test #60 MET Line Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	MET Line Station Lamp Updates completed successfully. **1** If complaints persist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use the **list config** command, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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MET Line Station Audits Test (#61)

This is a series of three tests that are classified as audits. These audits will abort if attempted on an out-of-service station. Although this test never actually returns a fail result (except for the internal system error), it is possible that it will enter error types 257 (over current) or 513 (open circuit) into the error log. To determine whether there are any problems that do not show up in the test result, look for these error types

in the error log. If these errors appear in the error log or if user complaints still exist, investigate by using other circuit pack tests and by examining the station, the wiring, and the connections. The tests are as follows:

Switchhook Audit	This is an update of the Communication Manager records according to the circuit packs' records.
Bad Scan Inquiry	A message is sent uplink that contains a count that is generated due to certain events relating to the link conditions. This is an indication of data transmission problems between the MET Line circuit pack and the voice terminal.
EPF Inquiry	The status of the Electronic Power Feed is sent uplink. Possible conditions are: EPF-on-ok, EPF-off, EPF-no-load, and EPF-on-overcurrent.

Table 554: Test #61 MET Line Station Audits Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
1	ABORT	The test was aborted due to an internal system error during the switchhook audit.
2		The test was aborted due to an internal system error during the bad scan inquiry.
3		The test was aborted due to an internal system error during the EPF audit inquiry. **1** Make sure that the station is not in an out-of-service state. **2** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The test failed due to an internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 554: Test #61 MET Line Station Audits Test

Error Code	Test Result	Description / Recommendation
	PASS	Hybrid Line Station audits passed. **1** Although this test will never actually return a FAIL result except for the **Internal system error** described above, it is possible that it will enter Error Type 257 or 513 into the Error Log. To determine whether there are any problems that don't show up in the test result, look for these error types in the Error Log. **2** If these errors appear in the Error Log, or if user complaints persist, investigate by using other circuit pack tests, and by examining the station, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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MET Line Ringer Update Test (#62)

In this update, a "ringer on" or a "ringer off" message is sent to the firmware to start and stop the ringer on the set.

Table 555: Test #62 MET Line Ringer Update Test

Error Code	Test Result	Description / Recommendation
3	ABORT	This port may have been busied out. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If present, release the port via **release station *extension*** and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.

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Table 555: Test #62 MET Line Ringer Update Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Hybrid Station Ringer Update passed. **1** If complaints persist, investigate using other circuit pack tests, and by examining the terminal, wiring, and connections.
0	NO BOARD	The test could not relate the internal ID to the port. This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** Issue the **busyout board** command. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to ensure that there is a valid board inserted.

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MED-GTWY (MEDIA GATEWAY)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run*	Full Name of MO
MED-GTWY	MAJOR	**test board *location***[1]	MEDIA GATEWAY

1 For information on specifying a location, see Command Syntax on page 179.

This maintenance object monitors the H.248 link to the Avaya G700 Media Gateway. It logs errors when the Keep Alive messages that are exchanged between the server and G700 fail. These messages indicate the status of the H.248 link between the two. If the keep alive messages are active all is well, if not an error is logged.

Error log entries and test to clear values

Table 556: MED-GTWY error log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)		None	MAJOR	OFF	
257 (b)		None	MAJOR	OFF	
513 (c)		None	MAJOR	ON	
769 (d)		None	MINOR	OFF	

Notes:

- **(a) Error Type 1**: this error type indicates a failure of the H.248 link keep alive messages between the server and the G700. This is an indication that the LAN or the platform is down.
- **(b) Error Type 257**: If the server is an LSP, this error type indicates that at least one Media Gateway is registered with the LSP.
- **(c) Error Type 513**: this error type indicates that there is a problem on the G700. Log on to the G700 and check the error log for problems using the MGP CLI.
- (d) **Error Type 769**: this error type is a transient error, indicating that the link has unregistered with the G700. If the G700 re-registers, the alarm is resolved. If the *link loss delay timer* on the primary server expires, Error Type 1 is logged.

System Technician-Demanded Tests: Descriptions and Error Codes

There are no System Technician-Demanded Tests associated with this MO.

MG-ANA (ANALOG MM711)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	For Location	Full Name of MO
MG-ANA	GGGVSPP	ANALOG MEDIA MODULE

Note: You must consult local records for the location and designation of the equipment rack where the G700 is mounted.

NOTE:
For more information, refer to the MO XXX-BD section of this document. In addition, refer to the AN-LN-PT MO and to the CO-TRK MO.

The Avaya MM711 Analog Trunk and Line Media Module provides 8 ports, any of which may be administered as one of the following:

Table 557: MM711 Analog Trunk and Line Media Module – port administration

Function	Group Type	Trunk Type	LED MWI
Central Office trunk (CO)	co fx wats	loop start ground start	
CAMA/E911 trunk	cama	loop start	
Direct Inward Dialing (DID) trunk	did	wink start immed start	
Analog Line on-or-off premises	n/a	n/a	with/ without MWI

The MM 711 Analog Media Module supports eight analog interfaces allowing the connectivity of Loop Start, Ground Start, Analog DID trunks, and 2-wire analog Outgoing CAMA E911 trunks. As well, the MM711 Analog Media Module allows connectivity of analog, tip/ring devices such as single line telephones, modems, or group 3 fax machines. Each port may be configured as either a trunk interface or a station interface. Also included is support for caller ID signaling, ring voltage generation for a variety of international frequencies and cadences and administrable line termination styles.

Analog modems are supported on the G700 only in limited configurations, in which the modem call stays within a single Media Gateway. If the modem is connected to an MM711 Analog Media Module, and the call goes to either a) another modem on an MM711 within the same Media Gateway, or b) the PSTN through an analog, T1/E1, or BRI trunk on the same Media Gateway, the call will succeed.

If the modem is connected to an MM711, and the call goes to a) a modem or trunk on a different Media Gateway or port network, or b) an IP trunk, the call will most likely fail. Modem calls are not supported even between Media Gateways in a stacked configuration.

The MM711 Analog Trunk and Line Media Module does not support Neon Lamp Message Waiting Indication (MWI). No maintenance of the terminal connected to the Neon Analog Line Media Module is performed.

NOTE:
For 1.3 and later releases, a single G700 can support up to four MM711 Analog Media Modules. For 1.2 and earlier releases, more than two MM711 Analog Media Modules might trip the G700 electronic breaker and bring down the power supply for the entire G700.

System Technician-Demanded Tests: Descriptions and Error Codes

NOTE:
Always investigate tests in the order they are presented in the table below when inspecting errors in the system. By clearing error codes associated with the NPE *Crosstalk Test, for example, you may also clear errors generated from other tests in the testing sequence.*

Table 558: System Technician-Demanded Tests: Order of Investigation

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND *
NPE Audit Test (#50) **Note:** *This test will abort with Error Code 1412.*		X		ND
Ringing Application Test (#51) Aborts with code 1412				
Control Channel Looparound Test (#52)	X	X		ND
SAKI Sanity Test (#53)		X	D	
NEON Test (#220) Aborts with code 1412				

*D = Destructive; ND = Nondestructive

For hardware error log entries and for more information on the tests listed in the table above refer to “MO XXX-BD (common port Media Module)” maintenance object documentation.

MG-ANN (Voice Announcements)

S8700 / S8500 / S8300 / G700

Voice Announcements over the LAN

The MG-ANN (Voice Announcements) maintenance object provides per board announcement storage time of up to 20 minutes (15 playback ports and 1 recording port that can also be used as a playback port), and allows for announcement file portability via LAN connectivity. MG-ANN also allows for LAN backup and restore of announcement files and the use of customer provided waveform (.WAV) files. The S8700 Media Server supports 10 integrated announcement boards (TN750, TN2501, CWY1), plus an additional 250 G700 announcement sources (total of 260). The S8300 Media Server supports 50 G700 announcement sources. Each G700 supports up to 20 minutes of recording time of up to 256 individual announcements.

NOTE:
The S8300 does not support standard port networks and TN type boards.

The MG-ANN hardware is located on the G700 mother board. Communication Manager maintenance supports the MG-ANN by using a virtual board concept to allow for board insertion and maintenance testing. The virtual slot location is V9.

System Technician-Demanded Tests: Descriptions and Error Codes

There are no System Technician-Demanded Tests for this MO.

MG-BRI (BRI Trunk Media Module MM720)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
MG-BRI	MINOR	**test board *location***	MO_MG_BRI

1 For information on specifying a ***location***, see Command Syntax on page 179.

The MM720 BRI Media Module contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64 Kb/s channels (B1 and B2) and over a 16Kb/s signaling (D) channel.

LEDs

The three LEDs on the Media Module faceplate indicate board status. When illuminated, the red LED indicates a board failure or a major or minor on-board alarm, the green LED indicates that testing is in progress, and the amber LED indicates that the board is in use.

ISDN Interface Reference Points

Figure 95, Integrated Trunk-Side BRI, ISDN Interface Reference Points, on page 1250 shows, for a generic integrated trunk-side BRI, the ISDN Interface Reference Points. Table 559, ISDN Interface Reference Point definitions, on page 1250 gives definitions for the generic ISDN Interface Reference Points.

Figure 95: Integrated Trunk-Side BRI, ISDN Interface Reference Points

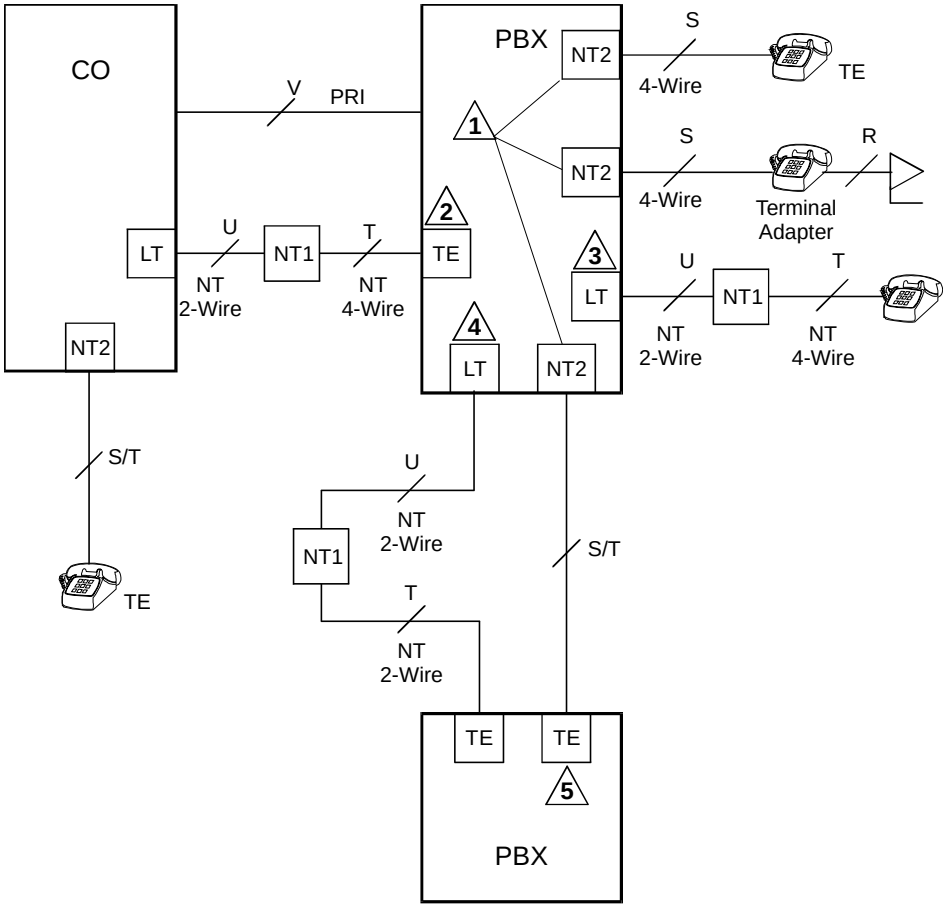

Table 559: ISDN Interface Reference Point definitions

LT	Logical Terminal
V	Primary Rate user/network (asymmetrical) trunk interface. The ECS is capable of acting as the user or as the network side of this 1.544 - or 2.048-Mbps interface.
R	Interface between Terminal Equipment and Network Termination
S	Basic Rate network-side 4-wire line interface
S/T	4-wire Basic Rate connection to a Network Termination[1].
T	4-wire Basic Rate interface to a Network Termination.[2]
TE	Terminal Equipment
U	Basic Rate network-side 2-wire line interface.
1	TN556B ISDN-BRI 4-Wire S/T-NT Line (A-law)
2	TN 2185 ISDN-BRI 4-Wire S Interface (Trunk Side)
3	TN2198 ISDN-BRI 2-Wire U Interface

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Table 559: ISDN Interface Reference Point definitions

4	TN2198 ISDN-BRI 2-Wire U Interface
5	TN 2185 ISDN-BRI 4-Wire S Interface (Trunk Side)

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1 Network Termination 2 (NT2), that terminates Layer 1 and higher layers. PBXs, LANs, and terminal controllers typically provide NT2 functionality including protocol handling and multiplexing for Layers 2 and 3.

2 Network Termination 1 (NT1), that terminates Layer 1 and monitors maintenance, performance, timing, power transfer, multiplexing, and multi-drop termination with contention resolution.

Error Log Entries and Test to Clear Values

Table 560: Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board GGGVM sh r 1
1 (a)	Any	None	MINOR	ON	
257 (b)	65535	Control Channel Loop Test (#52)	MINOR	ON	test board GGGVM r 20
513 (c)	4352 to 4357		None	ON	
769 (d)	4358				
1025 (e)		NPE/NCE Audit Test (#50)	None	ON	
1291 (f)	4359	Clear Error Counters (#270)	MINOR	ON	
3586 (g)			MINOR	OFF	
3840(h)	4096 to 4101				
3842 (i)	46095				
3843 (j)	46097				

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

- (a) Error Type 1 – The circuit pack stopped functioning or is physically removed from the system.

  This alarm logs approximately 11 minutes after removing the circuit pack and/or the SAKI Sanity Test (#53) fails.

  If the circuit pack is not in the system, insert a circuit pack in the same slot as the error indicates. See note (g).

- (b) Error Type 257 – Transient communication problems between the switch and this circuit pack. Execute the **test board GGGVM** command and refer to the repair procedures for the Control Channel Loop Around Test (#52).

- (c) Error Type 513 – On-board hardware failure. Aux data values correspond to the following detected errors:

Aux Value	Detected Error
4352	External RAM error
4353	Internal RAM error
4355	ROM checksum error
4357	Instruction set error

  Reset the circuit pack with the **busyout board GGGVM** and **reset board GGGVM** commands. When reset, the circuit pack executes a set of tests to detect the presence of any of the faults listed above. Detection of one of these errors during initialization causes the circuit pack to lock-up and appear insane to the system.

- (d) Error Type 769 – The circuit pack detects a program logic error. While no action is required, this error can lead to other errors against this circuit pack.
- (e) Error Type 1025 – The circuit pack cannot update and read back NPE/NCE memory. This error can be ignored, but may lead to other errors against this circuit pack.
- (f) Error Type 1291 – The MM720 BRI Media Module notifies maintenance software that it has detected a parity error while accessing its dynamic RAM (that stores the board's translation information and downloadable application firmware). Maintenance software resets the circuit pack.
- (g) Error Type 3586 – The SPE software detects an excessive number of up-link messages from the TN2185 board within a certain time period. To prevent the faulty board from flooding the switch with data, the switch software takes the board out of service and alarms it. The switch software also tells the Archangel to ignore up-link messages from the board.

  When the board is alarmed due to this error, the switch software periodically puts the board back in service and tells the Archangel to process up-link messages from the board. If the problem still exists, the software takes the circuit pack out of service again. If the circuit pack does not exhibit the problem for a certain time period, then maintenance software resolves the alarm and the circuit pack is left in service.

- (h) Error Type 3840 – The circuit pack received an inconsistent down-link message (a bad header, port number, data, sub-qualifier, or logical link) over the Control Channel.
- (i) Error Type 3842 – The board is receiving data from the bus faster than it can distribute the data to its endpoints, causing the FIFO RAM buffer to overflow. This error can occur occasionally due to the statistical sizing of the buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch. LAPD should recover from this problem, but it may degrade the performance of the LAN bus.

  When this error is reported, maintenance reads and clears the board counter and logs the problem in the maintenance error log.

- (j) Error Type 3843 – Bad translation RAM detected, but the call continues by using another translation location. The circuit pack reports this error when it cannot update NPE/NCE memory and read it back. This error is not service-affecting and can be ignored, but can lead to other types of errors against this circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

NOTE:
WheLn inspecting errors in the system, always investigate tests in the order listed below. By clearing error codes associated with the *Control Channel Loop Around Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Table 561: System Technician-Demanded Tests: Order of Investigation

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-Around Test (#52)	X	X	ND
NPE/NCE Audit Test (#50) Aborts with Error Code 1412		X	ND
LAN Receive Parity Error Counter Test (#595)		X	ND
SAKI Sanity Test (#53)		X	D

1 D = Destructive; ND = Nondestructive

Control Channel Loop Around Test (#52)

Refer to the repair procedure described in the "XXX-BD (Common Port Circuit Pack)" section.

NPE /NCE Audit Test (#50)

This test will abort with ABORT CODE 1412. This test is an audit that sends network update messages to various ports on a board. Since the Media Server does not handle network connections for the Media Gateway, this test is not intended to be run.

SAKI Sanity Test (#53)

CAUTION:
This test is destructive.

Refer to the repair procedure described in the "XXX-BD (Common Port Circuit Pack)" section. This test is only run as a part of a reset board procedure.

LAN Receive Parity Error Counter Test (#595)

The test reads and clears a circuit pack’s LAN Receive Parity Error Counter.

MG-DCP (Digital Line Media Module)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run*	Full Name of MO
MG-DCP	MIN	**test board *location*[1] sh**	Digital Line Media Module
MG-DCP	WRN	**test board *location* sh**	Digital Line Media Module

Note: You must consult local records for the location and designation of the equipment rack where the G700 is mounted.

1 For information on specifying a location, see Command Syntax on page 179.

DIG-LINE maintenance monitors and tests ports on digital line Media Modules and the hardware connected to those ports for lines administered as a digital station. Media Gateway-level maintenance is covered by “MG-DCP” whose strategy is described in the “XXX-BD (Common Port Media Module)” section.

NOTE:
Refer to XXX-BD (Common Port Media Module) for Media Module level errors. See also “DIG-LINE” for related line information.

MG-DS1 (DS1 Interface Media Module)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run*	Full Name of MO
MG-DS1	MAJOR	**test board *location*[1] sh**	DS1 Interface Media Module
MG-DS1	MINOR	**test board *location* l**	DS1 Interface Media Module
MG-DS1	WARNING	**test board *location* sh**	DS1 Interface Media Module

1 For information on specifying a ***location***, see Command Syntax on page 179

Echo Cancellation

The MM710 Media Module features an integrated echo canceller. Echo cancellation supports channels carrying voice and is not intended for channels that support data. The MM710 has the capability to detect modem tone and turn off echo cancellation accordingly for the duration of a data call. Echo cancellation on the MM710 will be administrable per channel. The echo cancellation circuitry on a given MM710 is driven by administrable parameters.

The MM710 Media Modules are intended for use with ATM, IP, wideband, or other complex services which are likely to have problems with echo.

The echo cancellation circuitry on a given MM710 is a right-to-use feature activated on the System-Parameters Customer-Options form. Also on this form is a field `Maximum Number of DS1 Boards with Echo Cancellation` that indicates the number of DS1 boards on which echo cancellation is activated for a specific customer.

The DS1 MEDIA MODULE form for the MM710 Media Module has fields to support echo cancellation: `Echo Cancellation?`, `EC Direction`, and `EC Configuration`. The `Echo Cancellation?` field displays only if the Echo Cancellation feature has been activated on the **system-parameters customer-options** form by entering a `y` in the `DS1 Echo Cancellation?` field. The `EC Direction` and `EC Configuration` fields do not display unless the user has entered `y` in the `DS1 Echo Cancellation?` field.

- EC Direction determines the direction from which echo will be eliminated, ether inward or outward.
- EC Configuration is the set of parameters that will be used when cancelling echo. This information is stored in firmware on the MM710 Media Module.

Echo cancellation is turned on or off on a trunk group basis using the **change trunk-group** command. If the TRUNK GROUP field, `DS1 Echo Cancellation?` is set to `y`, echo cancellation will be applied to every MM710 trunk member in that trunk group. The echo cancellation parameters used for a given trunk member are determined by the Echo Cancellation Configuration Number administered on the **DS1 Media Module** form for that specific trunk's board.

NOTE:
It is not necessary to busyout a port or trunk group to change the `DS1 Echo Cancellation?` field on page 2 of the **change trunk-group** form; however, the modified setting will not take effect until one of the following occurs:

- Port is busied-out/released
- Trunk group is busied-out/released
- Test trunk group is executed
- Periodic maintenance runs

Echo cancellation on the MM710 is selectable per channel, even though it is administrable on a trunk group basis. For example, if all but two ports on a MM710 need to have echo cancellation applied, those two ports must be put in a trunk group where the `DS1 Echo Cancellation` field is set to `n`. The remaining ports will be in a trunk group(s) where the `DS1 Echo Cancellation` field is set to `y`. A user will have the ability to cancel echo coming from the network (far-end echo) or coming from the switch (near-end echo).

MM710 DS1 Media Module

The MM710 Universal DS1 Interface Media Module provide an interface to the DS1 facility, and are designed to support 24 DS0 channels on a 1.544 Mbps DS1 link, or 32 DS0 channels on a 2.048 Mbps link. The DS0 channels can be administered as trunks to other switches, lines to off-premises stations, ports to line-side PRI terminating devices, or ports to other line-side non-PRI terminating devices. (DS0 channels on the MM710 can only be administered as trunks to other switches.) For more information on how MM710 ports can be used, see the maintenance objects (MOs): ISDN-SGR, ISDN-TRK, ISDN-LNK, TIE-DS1, CO-DS1, DID-DS1, and WAE-PT.

NOTE:
The MM710 provides Echo Cancellation, and in addition, the MM710 firmware may be updated using the firmware download feature.

The MG-DS1 maintenance strategy includes logging in-line errors reported by the MM710 Media Module, running tests for error diagnosis and recovery, and raising or clearing maintenance alarms.

MM710 Media Modules support the following:

- Digital Tie, CO, and DID trunks
- DS1 off-premises (OPS) lines
- Narrowband and wideband access endpoint ports
- ISDN-PRI trunks and accompanying signaling channel
- PRI endpoint ports (PE-BCHL) and accompanying signaling channel

Each trunk, line, or endpoint has its own maintenance strategy, but all depend on the health of the MM710 Interface Media Module. Refer to the following MOs for details: TIE-DS1, CO-DS1, DID-DS1, OPS-LINE, ISDN-TRK, ISDN-LNK, ISDN-SGR, WAE-PT and PE-BCHL.

Media Module Administration and Options

The DS1 configuration for each Media Module is administered on the **DS1 Media Module** form. `Bit Rate` is set to 1.544 Mbps for 24-channel systems, and 2.048 Mbps for 32-channel systems. `Country Protocol` is used to drive layer 3 protocol decisions based on PRI specifications specific to a given country (not those related to specific features). This Country Protocol is independent of the `Country` parameter administered on the **system-parameters country-options** form. Different MM710 Media Modules may be administered with different Country Protocols, allowing the switch to act as a gateway between two incompatible ISDN-PRI implementations (for example, between two different countries). US systems use country protocol 1.

CAUTION:

Echo cancellation is administered in part by administering an echo cancellation plan. The DS1 Echo Cancellation Plan 1 uses a 96ms echo tail and introduces **6db of loss** for additional cancellation. Because no digital facilities have ever introduced loss, this is an unexpected side effect of the Plan 1 echo cancellation feature. Since services personnel might not expect to find it there, services might try to change the loss plan to compensate, which can lead to other problems.

Error Log Entries and Test to Clear Values

Table 562: DS1 Interface Media Module Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0*	0	Any	Any	Any	test board GGGVS
1(a)	0	Media Gateway removed or SAKI Test (#53)	MIN/WRN**	ON	
18(b)	0	busyout board GGGVSpp	WARNING	OFF	release board GGGVS
23(c)	0		WARNING	OFF	add ds1 GGGVS
125(d)	none 3	None	MIN/WRN**	ON	
257	65535	Control Channel Loop Test (#52)	MINOR	ON	test board GGGVS l r 20
257(e)	Any	None			
513(f)	Any		MIN/WRN**	ON	
514(g)	46086		MIN/WRN**	ON	
769(h)	46085		MIN/WRN**	ON	
770(i)	46096		MIN/WRN**	ON	
1281	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN**	OFF	test board GGGVS
1320	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN**	OFF	test board GGGVS

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Table 562: DS1 Interface Media Module Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1321	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN**	OFF	test board GGGVS
1322	Any	Loss of Signal Alarm Inquiry Test (#138)	MINOR	ON	test board GGGVS
1323	Any	Loss of Signal Alarm Inquiry Test (#138)	MIN/WRN**	OFF	test board GGGVS
1324	Any	Loss of Signal Alarm Inquiry Test (#138)	WARNING	OFF	test board GGGVS
1400, 1401(j)	Any	Loss of Signal Alarm Inquiry Test (#138) and Echo Cancellation Test (#1420)	MINOR	ON	test board GGGVS
1537(k)	46082		MIN/WRN**	ON	
1538(l)	Any		MIN/WRN**	ON	
1793	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN /WRN ***	OFF	test board GGGVS
1794	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN /WRN***	OFF	test board GGGVS
1795	Any	Blue Alarm Inquiry Test (#139)	MAJ/MIN /WNG***	OFF	test board GGGVS
2049	Any	Red Alarm Inquiry Test (#140)	MIN/WRN**	OFF	test board GGGVS
2305	Any	Yellow Alarm Inquiry Test (#141)	MIN/WRN**	OFF	test board GGGVS
2306	Any	Yellow Alarm Inquiry Test (#141)	MIN/WRN**	OFF	test Board GGGVS
2561	Any	Major Alarm Inquiry Test (#142)	MIN/WRN**	OFF	test board GGGVS
2817		Minor Alarm Inquiry Test (#143)	MIN/WRN**	OFF	test board GGGVS
3073 to 3160 (m)	Any	Slip Alarm Inquiry Test (#144)	MIN/WRN**	OFF	test board GGGVS r 6
3585 to 3601 (o)	Any	Misframe Alarm Inquiry Test (#145)	MIN/WRN**	OFF	test board GGGVS r 6
3840(p)	Any	None			
3841(q)	4358				
3842(r)	46097				

Table 562: DS1 Interface Media Module Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3999(t)	Any	None			

*Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

**If ports are assigned to the Media Module, then a minor alarm is raised. If no ports are assigned to the Media Module, then a warning alarm is raised. The alarm is raised after the Media Module has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the Media Module.

***Minor alarms on this MO may be downgraded to warning alarms based on values set in the **set options** command.

Major alarms on this MO may be downgraded to minor or warning alarms based on values set in the **set options** command.

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Notes:

- **(a) Error Type 1**— Indicates that the Media Module has totally stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the Media Module has been removed or 11-minutes after the SAKI Test (#53) fails.To be fully administered, a MM710 must meet all three of the following conditions:
  - Have an entry in the circuit plan using the **change media module** command
  - Be administered using the **add ds1 GGGVS** command
  - Be physically inserted into the correct slot

  If the Media Module has an entry in the circuit plan and either of the other two conditions are *not* met, a MINOR alarm is logged.

  1 To resolve the error do either of the following:
    - Make sure that all conditions for administration are met and that a functioning MM710 is inserted in the correct slot.
    - Completely remove the MM710 from the system using the following steps.

  2 Remove any administered DS1 trunks, access endpoints or PRI endpoints associated with the Media Module from their trunk groups.

  3 Execute the **remove ds1 GGGVS** and **change media module GGGVS** commands.
- **(b) Error Type 18** — The MM710 Interface Media Module has been busied out by a **busyout board GGGVS** command.
- **(c) Error Type 23** — The MM710 Media Module is not completely administered. To be fully administered, the MM710 Media Module must:
  - Have an entry in the circuit plan using the **change media module** command
  - Be administered using the **add ds1 GGGVS** command
  - Be physically inserted into the correct slot

  A DS1 (MG-DS1, DS1-BD) differs from most Media Modules in that inserting the Media Module into the switch is not enough to make the board usable. It must also be administered with the **add ds1** command.

- **(d) Error Type 125: No Aux Data —** An incorrect Media Module is inserted in the slot where the MM710 Media Module is logically administered.

  To resolve this problem, either:

  - Remove the incorrect Media Module and insert the logically administered Media Module.
  - Use the **change circuit-pack** command to re-administer this slot to match the Media Module inserted.

- **(e) Error Type 257 —** This error is associated with the Common Port Media Module Maintenance Test.

  Refer to XXX-BD (Common Port Media Module) Maintenance documentation for details.

- **(f) Error Type 513 —** The MG-DS1 (MM710) has detected a transient hardware problem.

  The value in the Aux Data field indicates the type of hardware problem:

Aux Data	Problem
4352	External RAM failure
4353	Internal RAM failure
4355	Internal ROM failure

  If the board detects only one of these hardware problems, then the error will disappear when none of these faults are detected for 10 minutes. If the same Aux Data value is logged more than once in a 24 hour period, the Media Module should be replaced.

- **(g) Error Type 514 — This is a** LAN External RAM Error.

  This error occurs when there is a hardware fault in the PPE external RAM. The RAM is used for message buffering to and from the Packet Bus. This error should not occur frequently. If it does (10 times within 30 minutes), the Media Module should be replaced.

- **(h) Error Type 769 — This is a** transmit FIFO Underflow Error.

  This error occurs when the Media Module cannot find the end of frame bit when transmitting a frame to the Packet Bus. An alarm is raised if this error occurs three times within 10 minutes. Clear the alarm using the following commands: **busyout board GGGVS**, **reset board GGGVS**, **test board GGGVS long**, **release board GGGVS**. If the error recurs within 10 minutes, replace the Media Module.

- **(i) Error Type 770 — This is an** Unable to Write LAN Translation RAM Error.

  This error occurs when a call is aborted because there are no available translation RAM locations for the call connection attempt. An alarm is raised if this error occurs two times within 10 minutes. Clear the alarm using the following commands: **busyout board GGGVS**, **reset board GGGVS**, **test board GGGVS long**, **release board GGGVS**. If the error recurs within 10 minutes, replace the Media Module.

- **(j) Error Types 1400, 1401 — This is an Echo Cancellation error.**

  Echo Cancellation errors are logged when:

  - Error 1400 - Echo canceller function failed. The Echo Canceller Function Test, which is executed by firmware, failed.
  - Error 1401 - Echo canceller memory failed. The Echo Canceller Memory Test, which is executed by firmware, failed.

  Echo Cancellation is no longer being supplied by the board. Clear the alarm using the following commands: **busyout board GGGVS**, **test board GGGVS long**, **release board GGGVS**. If Test #1420 (Echo Canceler Test) fails, replace the Media Module.

- **(k) Error type 1537 — This is a** LAN Bus Timeout Error.

  This error occurs when the Media Module transmits too many bytes on the LAN bus for a single frame. This condition may be caused by an on-board fault or by faulty data received on one of the Media Module's external ports. If any of the ports on this Media Module are alarmed, refer to the repair procedures for those maintenance objects.

  If the error occurs three times within 10 minutes, the board is isolated from the Packet Bus and the board alarmed. To clear the alarm and restore the board to the Packet Bus, use the commands **busyout board GGGVS**, **reset board GGGVS**, **test board GGGVS long**, **release board GGGVS**.

  If the problem persists, and there are no PKT-BUS alarms or port alarms, then replace the Media Module.

- **(l) Error Type 1538 —** The hyperactive Media Module is out-of-service and may exhibit one or more of the following symptoms:

  - The common Media Module level tests such as Test #50 abort with error code 2000.
  - The tests run on the ports of this Media Module return a NO-BOARD result.
  - A busyout/release of the Media Module has no affect on test results.
  - A **list configuration** command shows that the Media Module and ports are properly installed.

  The Media Module is isolated from the system and all trunks or ports on this Media Module are placed into the out-of-service state. The system will try to restore the Media Module within 20-30 minutes. When no faults are detected for 20-30 minutes, the MM710 is restored to normal operation. All trunks or ports of the MM710 are then returned to the in-service state.

  If the board is not restored to normal operation, or the error recurs after the board was restored to normal operation, escalate the problem.

- **(m) Error Types 3073 to 3160 —** Error Type 3073 shows that this board is receiving slips and the AUX Data "minus 3072" shows the last slip count reported.

- **(o) Error Types 3585 to 3601 —** Error Type 3585 shows that this board is receiving misframes, and the AUX Data "minus 3584" shows the last misframe count reported.

- **(p) Error Type 3840 —** This error type is not service-affecting. No action is required.

  These errors are reported by the Media Module when it receives a bad control channel message from the switch. The auxiliary data identifies the following error events:

Aux Data	Event
4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link

- **(q) Error Type 3841—** The MG-DS1 (MM710) has detected a transient hardware logic error (for example, program logic inconsistency).

  This error will disappear when no faults are detected for 100 minutes.

- **(r) Error Type 3842 — This is a** Bad Translation RAM Location Found Error.

  This error is not service-affecting. No action is required. A Bad Translation RAM is detected, but the call continues by using another translation location.

- **(t) Error Type 3999 — This error** indicates that the Media Module sent a large number of control channel messages to the switch within a short period of time.

  If Error Type 1538 is also present, then the Media Module was taken out-of-service due to hyperactivity. If Error Type 1538 is not present, then the Media Module has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the Media Module is being lightly used, it may indicate a problem with the Media Module or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented in Table 563, System Technician-Demanded Tests: Order of Investigation, on page 1262. By clearing error codes associated with the Echo Cancellation Test, for example, you may also clear errors generated from other tests in the testing sequence.

Table 563: System Technician-Demanded Tests: Order of Investigation

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop	D/ND*
Echo Cancellation Test (#1420)		X			D
Control Channel Loop Test (#52)		X			ND
NPE Connection Audit Test (#50) **NOTE:** This test will ABORT with Error Code 1412					
Loss of Signal Alarm Inquiry Test (#138)	X	X			ND
Blue Alarm Inquiry Test (#139)	X	X			ND
Red Alarm Inquiry Test (#140)	X	X			ND
Yellow Alarm Inquiry Test (#141)	X	X			ND
Major Alarm Inquiry Test (#142)	X	X			ND
Minor Alarm Inquiry Test (#143)	X	X			ND
Slip Alarm Inquiry Test (#144)	X	X			ND

Table 563: System Technician-Demanded Tests: Order of Investigation

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop	D/ND*
Misframe Alarm Inquiry Test (#145)	X	X			ND
Translation Update Test (#146)	X	X			ND
SAKI Sanity Test (#53)			X		D
Internal Looparound Test (#135) **Note:** This test will ABORT with Error Code 1412			X		D
*D = Destructive; ND = Nondestructive					

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Control Channel Looparound Test (#52)

This test queries the Media Module for its Media Module vintage to verify angel communication.

Table 564: Test #52 Control Channel Looparound Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The Media Module failed to return the Media Module code or vintage. Retry the command a maximum of 5 times. If the problem continues, replace the Media Module. Retry the command a few times a maximum of 5 times.
	PASS	Communication with this Media Module is successful.

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Table 564: Test #52 Control Channel Looparound Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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SAKI Sanity Test (#53)

CAUTION:
This test resets the Media Module. The test is highly destructive and can only be initiated by a system technician-demanded **reset board GGGVS** command.

Table 565: Test #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	System resources required for this test are not available. Retry the **reset board** command at 1-minute intervals a maximum of 5 times.
1005	ABORT	Wrong Media Module configuration to run this test. This error applies only to DS1 Interface Media Modules. It means the DS1 Interface Media Module is providing timing for the system, and therefore, it cannot be reset without major system disruptions. If the Media Module needs to be reset, then set synchronization to another DS1 Interface Media Module or to the Tone-Clock Media Module and try again.
1015	ABORT	Port is not out-of-service. Busyout the Media Module. Execute the **reset board** command again.

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Table 565: Test #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
2100	ABORT	System resources required for this test are not available. Retry the **reset board** command at 1-minute intervals a maximum of 5 times.
1	FAIL	The Media Module failed to reset.
2	FAIL	The Media Module failed to restart. Execute the **reset board** command again. If the problem persists, replace the Media Module.
	PASS	The Media Module initializes correctly. Run the Short Test Sequence.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Loss of Signal Alarm Inquiry Test (#138)

This test verifies the synchronization status, echo cancellation, and continuity of the DS1 link. The Loss of Signal alarm indicates that the MM710 Interface Media Module is unable to derive the synchronization clock from the DS1 facility. When the MM710 Interface Media Module detects a Loss of Signal alarm, it stops providing the synchronization clock for the system, if it is administered as a timing source, and transmits a Yellow alarm to the remote DS1 endpoint.

NOTE:
Synchronization is not administered from the SAT. It is administered via a CLI session with the G700 Media Gateway Processor.

When the Loss of Signal alarm is confirmed, maintenance software places all trunks or ports of the MM710 Interface Media Module into the out-of-service state. The inquiry test will run every 10 minutes until the loss of signal has been restored.

The MM710 Interface Media Module raises a Loss of Signal alarm after the signal has been lost for about 1 second. It will not retire the alarm until the signal has returned for about 10 seconds.

Echo Cancellation

If the MM710 firmware detects a serious echo canceller hardware error, it notifies maintenance software. When the maintenance subsystem receives notification of the echo cancellation error, it executes this *Loss Of Signal Alarm Inquiry* test.

This test, in addition to querying for a loss of signal condition and CSU errors, also queries MM710 to confirm the echo canceller error. A minor alarm is raised if the error is confirmed. The trunks of the board remain in-service since the board is still functional except for the echo cancellation capability.

If a loss of signal condition co-exists with CSU and/or echo canceller errors, the loss of signal condition takes priority, and the board and all trunks on the board are put in the out-of-service state. Errors are logged, however, for each error type.

When the maintenance subsystem receives notification that the echo canceller hardware error condition no longer exists, the maintenance subsystem restores the board and all trunks to their previous service state, if the alarm can be cleared (no other CSU errors or loss of signal conditions exist).

NOTE:
The DSU functionality is not available in this release of Communication Manager.

Table 566: TEST #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals for a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.
	FAIL	MM710 detects a Loss of Signal alarm. The physical link is broken or the remote DS1 endpoint is down. All trunks or ports of this MM710 are out-of-service. If the MM710 connects to a T1 network facility: If the MM710 connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the MM710 Interface Media Module connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. If the MM710 connects to a line-side terminating device such as a PRI terminal adapter: Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 Interface Media Module and the cable. Check the physical connection of the MM710 Interface Media Module to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures.

Table 566: TEST #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
1400	FAIL	Echo Canceller Function failed, this could be a hardware problem on the MM710: Issue the **busyout board** command. Issue the **test board long** command. Issue the **release board** command. If Test 1420 still fails, replace the board.
1401	FAIL	Echo Canceller Function failed, this could be a hardware problem on the MM710: Issue the **busyout board** command. Issue the **reset board** command. Issue the **test board long** command. Issue the **release board** command. If the test still fails replace the board.
	PASS	DS1 signal is present and the physical link is healthy.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Blue Alarm Inquiry Test (#139)

The Blue Alarm is a signal sent by the remote DS1 endpoint when it is out-of-service. The Blue Alarm Inquiry Test checks the blue alarm status of the remote DS1 endpoint.

When the MM710 Interface Media Module detects a Blue Alarm signal from the remote DS1 endpoint, the Media Module transmits a Yellow alarm to the remote DS1 endpoint and sends a BLUE ALARM message to the maintenance software. When the Blue alarm is confirmed, the maintenance software

places all trunks or ports of the MM710 Interface Media Module into the out-of-service state. The inquiry test runs every 10 minutes until the Blue alarm is cleared.

The MM710 Interface Media Module takes one second to recognize and report a Blue alarm and 16 seconds to recognize and report the resolution of a Blue alarm. When the Blue alarm is cleared, the MM710 Interface Media Module stops transmitting the Yellow alarm and places the trunks or ports back into the service state before the Blue alarm occurs.

Line Loopback Alarm

The Line Loopback (LLB) is used by the remote DS1 endpoint to put the DS1 board into a loopback mode. When the DS1 board is in the LLB mode, the arriving bit pattern is regenerated and sent back. The Line Loopback (LLB) Alarm activates when the in-band activate LLB bit pattern arrives continuously for 5 seconds on the DS1 line. The LLB deactivates when the in-band deactivate LLB bit pattern arrives continuously for 5 seconds on the DS1 line.

Since LLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Payload Loopback Alarm

The Payload Loopback (PLB) is used by the remote DS1 endpoint to put the switch DS1 into a loopback mode. The PLB Alarm activates when a network protocol activate bit pattern arrives over the 4Kbps ESF data link on the DS1 line. The PLB deactivates when a network protocol deactivate bit pattern arrives over the 4Kbps ESF data link on the DS1 line.

Since PLB is a maintenance condition rendering all DS0 channels unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm

Table 567: TEST #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals for a maximum of 5 times.

Table 567: TEST #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.
	FAIL	The remote DS1 endpoint is out-of-service.
1 1794	FAIL	The MM710 Interface Media Module detects a Line Loopback Alarm (LLB). If the DS1-M interface Media Module connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the MM710 interface Media Module connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. If the MM710 interface Media Module connects directly to a line-side terminating device (for example, a PRI terminal adapter), call the vendor of the terminating device to diagnose the equipment.
1795	FAIL	The MM710 Interface Media Module detects a Payload Loopback Alarm (PLB). If the MM710 Interface Media Module connects to a leased T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the MM710 Interface Media Module connects directly to another DS1 board, call the system technician of the remote switch to diagnose the DS1 endpoint. If the MM710 Interface Media Module connects directly to a line-side terminating device such as a PRI terminal adapter contact the vendor of the terminating device to diagnose the equipment.

Table 567: TEST #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	PASS	Remote DS1 endpoint is in-service. Neither a Blue alarm nor a Line Loopback alarm nor a Payload Loopback Alarm is detected by the MM710 Interface Media Module.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Red Alarm Inquiry Test (#140)

An MM710 Interface Media Module raises a Red alarm when the framing pattern of the incoming DS1 bit stream has been lost. The Red Alarm Inquiry Test checks the framing status of an MM710 Interface Media Module. An MM710 Interface Media Module takes 3 seconds to recognize and report a Red alarm and 10 seconds to recognize and report the resolution of a Red alarm.

When the MM710 Interface Media Module detects a Red alarm, the Media Module transmits a Yellow alarm to the remote DS1 endpoint and sends a RED ALARM message to the maintenance software. After the Red alarm is confirmed, the maintenance software places all trunks or ports of the Media Module into the out-of-service state. The inquiry test runs every 10 minutes until the Red alarm is cleared.

When the Red alarm is cleared, the MM710 Interface Media Module stops transmitting the Yellow alarm to the remote DS1 endpoint. The maintenance software restores all trunks or ports of the MM710 Interface Media Module to the service state it was in before the Red alarm occurred.

Loss of Multiframe Alarm

If the MM710 Interface Media Module is administered using DMI-BOS signaling, the MM710 Interface Media Module raises a Loss of Multiframe Alarm (LMA) when it cannot interpret the incoming signaling bits to synchronize to the multiframe pattern received in the 24th channel. Once the MM710 Interface Media Module detects an LMA, the Media Module transmits a Remote Multiframe Alarm (RMA) to the remote DS1 endpoint. Maintenance software handles both Red alarm and LMA alarm(s) using the same mechanism.

Table 568: TEST #140 Red Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.

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Table 568: TEST #140 Red Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	FAIL	The MM710 interface Media Module detected a red alarm. An out of frame condition occurred on the MM710 interface Media Module. The MM710 interface Media Module will transmit a yellow alarm to the remote MM710 endpoint until the red alarm is retired. If the MM710 connects to a T1 network facility or to another switch, do the following. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. Check the physical connectivity of the MM710 packs and of the cable. Replace the local MM710 interface Media Module, and repeat the test. If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.

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Table 568: TEST #140 Red Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
1	FAIL	The test failed. The MM710 interface Media Module detected a loss of multiframe alarm (LMA). An out of frame condition occurred on the MM710 interface Media Module. The MM710 interface Media Module will transmit a remote multiframe alarm (RMA) to the remote MM710 endpoint until the LMA is retired. If the MM710 connects to a T1 network facility or to another switch, do the following: Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. Check the physical connectivity of the MM710 packs and of the cable. Replace the local MM710 interface Media Module, and repeat the test. If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.
	PASS	No Red alarm is detected on the MM710 Interface Media Module.

Table 568: TEST #140 Red Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Yellow Alarm Inquiry Test (#141)

Receiving a Yellow alarm from a remote DS1 endpoint indicates that the remote DS1 endpoint has an out-of-frame condition. The Yellow Alarm Inquiry Test is used to determine whether the remote DS1 endpoint is transmitting a Yellow alarm. The MM710 Interface Media Module takes 500 msec to recognize and report a Yellow alarm and 500 msec to recognize and report that a Yellow alarm condition is cleared.

When the MM710 Interface Media Module detects a Yellow alarm from the remote DS1 endpoint, it sends a YELLOW-ALARM uplink message to the maintenance software. After the maintenance software receives the YELLOW-ALARM message, the Yellow Alarm Inquiry Test is run to confirm the Yellow alarm. Once the Yellow alarm is confirmed, the maintenance software places all trunks or ports on the Media Module into the out-of-service state. The Inquiry Test runs every 10 minutes until the Yellow alarm is cleared.

When the Yellow alarm is cleared, the maintenance software restores all trunks or ports on the MM710 Interface Media Module back to their previous service state before the Yellow alarm was raised.

This Yellow alarm corresponds to the yellow F2 state documented in CCITT Recommendation I.431.

Remote Multiframe Alarm

Remote Multiframe Alarm (RMA) indicates that the remote DS1 endpoint is in a Loss of Multiframe Alarm condition while the MM710 Interface Media Module is administered using the DMI-BOS common channel signaling. The RMA is handled as a Yellow alarm.

Yellow F5 Fault Alarm

For 32-channel E1 operation with CRC4 on, the F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431.

Table 569: TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.

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Table 569: TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	FAIL	The MM710 interface Media Module detected a yellow alarm sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint. If the MM710 connects to a T1 network facility or to another switch, do the following: Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. Check the physical connectivity of the MM710 packs and of the cable. Replace the local MM710 interface Media Module, and repeat the test. If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.

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Table 569: TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
1	FAIL	The MM710 interface Media Module detected a remote multiframe alarm (RMA) sent by the remote DS1 endpoint. An out of frame condition occurred at the DS1 endpoint. If the MM710 connects to a T1 network facility or to another switch, do the following: Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. Check the physical connectivity of the MM710 packs and of the cable. Replace the local MM710 interface Media Module, and repeat the test. If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.

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Table 569: TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
2	FAIL	The MM710 interface Media Module is reporting a Yellow F5 fault alarm. There is a fault in the User-Network interface from the user (PBX) to the network. An out-of-frame condition occurs on the remote DS1 endpoint. If the MM710 connects to a T1 network facility: Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service to diagnose the remote DS1 endpoint. Check the physical connectivity of the DS1 Interface Media Modules and cable. Replace the local MM710 Interface Media Module and repeat the test. If the MM710 connects to a line-side terminating device such as a PRI terminal adapter: Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 Interface Media Module to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. Replace the local MM710 Interface Media Module and repeat the test.
	PASS	Neither a Yellow alarm nor a Remote Multiframe Alarm nor a F5 state alarm is being received from the remote DS1 endpoint.

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Table 569: TEST #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Major Alarm Inquiry Test (#142)

The Major alarm raised by an MM710 Interface Media Module indicates that the average bit error rate on the DS1 facility is greater than 1/1000. The Major Alarm Inquiry Test is used to determine that the received DS1 bit error rate is greater than 1/1000. The MM710 Interface Media Module takes 10 seconds to recognize and report a Major alarm and 10 seconds to recognize and report that a Major alarm condition is cleared.

When the MM710 Interface Media Module detects a Major alarm, it sends a MAJOR-ALARM message to the maintenance software. (32-channel interfaces send a YELLOW alarm to the far end). After the maintenance software receives a MAJOR-ALARM message, the Major Alarm Inquiry Test is initiated to confirm the Major alarm on the MM710 Interface Media Module. The Inquiry Test runs every 10 minutes until the Major alarm is cleared. The maintenance software places all trunks or ports on the Media Module in the out-of-service state if the Major alarm persists for more than 20 minutes.

When the Major alarm is cleared, the maintenance software restores all trunks or ports on the Media Module to their previous service state before a Major alarm occurs.

Table 570: TEST #142 Major Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.
	FAIL	If the MM710 connects to a T1 network facility or to another switch, do the following: The performance of the DS1 link between the MM710 interface Media Module and the remote DS1 endpoint is very poor. Enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or the technician at the remote switch to diagnose the equipment. Check the physical connectivity of the MM710 interface Media Modules and the cable. Replace the local MM710 interface Media Module, and repeat the test.

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Table 570: TEST #142 Major Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	FAIL *(cont'd.)*	If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: The performance of the DS1 link between the MM710 interface Media Module and the line-side terminating device is very poor. Enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM7101 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.
	PASS	No Major alarm is detected in the MM710 Interface Media Module.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Minor Alarm Inquiry Test (#143)

The Minor alarm raised by an MM710 Interface Media Module indicates that the average bit error rate on the DS1 facility is greater than 1/1,000,000, but less than 1/1000. The Minor Alarm Inquiry Test is used to determine that the received DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. When D4 framing mode is selected, the MM710 Interface Media Module takes 41-minutes to recognize and report a Minor alarm and 41-minutes to recognize and report that a Minor alarm condition has cleared. If

ESF framing mode is selected, the MM710 Interface Media Module takes 10 minutes to recognize and report a Minor alarm and 10 minutes to recognize and report that a Minor alarm condition has cleared.

When the MM710 Interface Media Module detects a Minor alarm condition, it sends a MINOR-ALARM message to the maintenance software. After the maintenance software receives a MINOR-ALARM message, the Minor Alarm Inquiry Test is initiated to confirm the Minor alarm. All trunks or ports on the Media Module are kept in the in-service state after the Minor alarm is confirmed. The Minor Alarm Inquiry Test runs every 10 minutes until the Minor alarm is cleared.

Table 571: TEST #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.

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Table 571: TEST #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	FAIL	Minor alarms are often accompanied by slip and misframe alarms against the board. Trunk alarms and hardware error logs may occur on the associated trunks. If the MM710 connects to a T1 network facility or to another switch, do the following: The performance of the DS1 link between the MM710 interface Media Module and the remote DS1 endpoint is poor. Enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or the technician at the remote switch to diagnose the equipment. Check the physical connectivity of the MM710 interface Media Modules and the cable. Replace the local MM710 interface Media Module, and repeat the test.
	FAIL *(cont'd.)*	If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: The performance of the DS1 link between the MM710 interface Media Module and the line-side terminating device is very poor. Enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Obtain the error seconds measurement on the terminating device (if possible). Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.
	PASS	No Minor alarm is detected in the MM710 Interface Media Module.

Table 571: TEST #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Slip Alarm Inquiry Test (#144)

Slips occur when transmitter and receiver are not running at precisely the same clock rate. The MM710 Interface Media Module can detect both positive and negative slips on the DS1 facility. The Slip Alarm Inquiry Test is used to acquire the total number of slips that have occurred on a DS1 link.

When the MM710 Interface Media Module detects a slip condition, the Media Module increments the on-board slip counter by one. A SLIP-COUNT message is spontaneously sent to the system software after the counter reaches a threshold (for example, 88). When the maintenance software receives the SLIP-COUNT message, the Slip Alarm Inquiry Test is initiated to query the slip counters on an MM710 Interface Media Module and total the slip counts in the maintenance software.

If the count of slips is over the threshold, a Minor alarm is raised against the MM710 Interface Media Module. All trunks or ports of the MM710 Interface Media Module remain in the in-service state.

Table 572: TEST #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.

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Table 572: TEST #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
1 to 88	FAIL	The test failed because the MM710 interface Media Module and the remote DS1 endpoint are not synchronized to the same clock rate. The MM710 interface Media Module detected a slip alarm. The error code equals the number of slips detected by the MM710 interface Media Module since the last slip alarm inquiry test. If the MM710 connects to a T1 network facility or to another switch, do the following: Retry the command at 1-minute intervals for a maximum of 5 times. For a DS1 interface Media Module, enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or the technician at the remote switch to diagnose the remote DS1 endpoint. Check the physical connectivity of the MM710 interface Media Modules and the cable. Replace the local MM710 interface Media Module, and repeat the test.
1 to 88 *(cont.)*	FAIL *(cont'd.)*	If the MM710 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: Retry the command at 1-minute intervals for a maximum of 5 times. Enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.
	PASS	No Slip alarm is detected on the MM710 Interface Media Module.

Table 572: TEST #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Misframe Alarm Inquiry Test (#145)

Misframe Alarm indicates that framing bits observed on an MM710 Interface Media Module are in error. The Misframe Alarm Inquiry Test queries the total number of misframes that have occurred on a DS1 Interface Media Module since the last inquiry.

When the DS1 Interface Media Module detects a misframe error, it increments its misframe counter by one. If the counter reaches a specified threshold (i.e., 17), a MISFRAME-COUNT message is automatically sent to the switch maintenance software. After the maintenance software receives the MISFRAME-COUNT message, the Misframe Alarm Inquiry Test is initiated to collect the misframe counts from the MM710 Interface Media Module.

A Minor alarm against the MM710 Interface Media Module is raised, but all trunks or ports of the MM710 Interface Media Module remain in the in-service state.

Table 573: TEST #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute intervals a maximum of 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.

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Table 573: TEST #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
1 to 17	FAIL	The test failed because the MM710 interface Media Module detected errors in the received framing bits pattern. The error code equals the number of misframes detected by the MM710 interface Media Module since the last misframe alarm inquiry test. Major bit and minor bit error rate (error types 2561 and 2817) error logs often accompany misframe alarms. Clearing the cause of these error logs may clear the misframes which are occurring. If the MM710 connects to a T1 network facility or to another switch, do the following: Retry the command at 1-minute intervals for a maximum of 5 times. If the DS1 interface Media Module is a MM710, enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. Contact T1 Network Service or the technician at the remote switch to diagnose the remote DS1 endpoint. Check the physical connectivity of the MM710 interface Media Modules and the cable. Replace the local MM710 interface Media Module, and repeat the test.
1 to 17 *(cont.)*	FAIL *(cont'd.)*	If the MM710 connects to a line-side terminating device such as a PRI terminal adapter: Retry the command at 1-minute intervals for a maximum of 5 times. Enter the **list measurement ds1-log GGGVS** command to read the error seconds measurement. Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. Contact the vendor of the line-side terminating device to diagnose the equipment. Check the physical connection of the MM710 interface Media Module to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. Replace the local MM710 interface Media Module and repeat the test.
	PASS	No Misframe alarm is detected on the MM710 Interface Media Module.

Table 573: TEST #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Translation Update Test (#146)

The Translation Update Test sends the circuit-pack-level information specified by System Administration to the MM710 Interface Media Module. Translation includes the following data administered for a MM710 Interface Media Module (see output of **display ds1 GGGVS** command): DS1 Link Length between two DS1 endpoints, Synchronization Source Control, All Zero Suppression, Framing Mode, Signaling Mode, Time Slot Number of 697-Hz Tone, Time Slot Number of 700-Hz Tone, etc.

Table 574: TEST #146 Translation Update Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal system error Retry the command at 1-minute interval s a maximum of 5 times.
	FAIL	Internal system software error. Enter the **display ds1 GGGVS** command to verify the DS!-MM Interface Media Module translation.
	PASS	Translation data has been downloaded to the DS1-M Interface Media Module successfully.

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Table 574: TEST #146 Translation Update Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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Echo Canceller Test (#1420)

CAUTION:

This test is executed only for MM710 Media Modules that have been administered on the DS1 Media Module form to provide echo cancellation. The MM710 must be busied out before this demand test is run.

This test is for the MM710 Media Module. The test originates from a manually initiated **test board long** demand test of a MM710 Media Module. The test instructs firmware to test the echo cancellation circuity. The MM710 firmware tests echo cancellation on a subset of channels. If any channel fails twice, or if any two channels fail once, the test fails, and echo cancellation is bypassed on all channels of the board. Otherwise, the test passes, and echo cancellation is configured to the administered parameters.

Table 575: Test #1420 Echo Canceller Test

Error Code	Test Result	Description/ Recommendation
1015	ABORT	The board is not busied out. This test will abort if the MM710 Media Module under test is in service.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive Media Module is out of service and one or more of the following symptoms may be exhibited. The MG-DS1 tests (such as Test #138 and Test #139) are aborting with error code 2000. The tests run on the ports of this Media Module are returning a no board result. A **busyout** or a **release** command has no affect on the test results. A **list config** command shows that the Media Module and the ports are properly installed. When hyperactivity occurs, the Media Module is isolated from the system, and all of the trunks for this Media Module are placed into the out of service state. The system will try to restore the Media Module within 15 minutes. When no faults are detected for 15 minutes, the MM710 interface Media Module is restored to normal operation. All of the trunks for the MM710 interface Media Module are then returned to the in service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the Media Module.
2012	ABORT	Internal system error. Retry the command at 1-minute intervals for a maximum of 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. Retry the command at 1-minute intervals for a maximum of 5 times.
2500	ABORT	Internal system error. Retry the command at 1-minute intervals for a maximum of 5 times.

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Table 575: Test #1420 Echo Canceller Test

Error Code	Test Result	Description/ Recommendation
1400, 1401	FAIL	The Echo Cancellation Test has failed: Error 1400 - Echo canceller function failed. The Echo Canceller Function Test, which is executed by firmware, failed. Error 1401 - Echo canceller memory failed. The Echo Canceller Memory Test, which is executed by firmware, failed. Echo Cancellation is no longer being supplied by the board. Clear the alarm using the following commands: **busyout board GGGVS**, **test board GGVS long**, **release board GGVS**. If the test still fails, replace the Media Module. When this test fails, echo cancellation will be bypassed on all channels on the board. The Media Module can still be used for a T1/E1 line interface without echo cancellation. This capability provides limited service for the customer until the Media Module can be changed out.
	PASS	The Echo Cancellation feature is functioning properly.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 GGGVS** command to administer the MM710 interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. Issue the **reset board** command. Issue the **release board** command. Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

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MG-ICC (Internal Call Controller)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run*	Full Name of MO
MG-ICC	MAJOR	None	INTERNAL CALL CONTROLLER

This maintenance object monitors the H.323 link between the S8300 Media Server running as an LSP or as the primary call controller. It logs errors when the keep alive messages that are exchanged between the servers fail. These messages indicate the status of the H.323 link between the two. If the keep alive messages are active all is well; if not, an error is logged.

Error log entry and test to clear value

Table 576: MG-ICC error log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)		None	MAJOR	OFF	

Note:

- **(a) Error Type 1**: this error type indicates a failure of the H.323 link keep alive messages between the LSP and primary call controller. This is an indication that the LAN or the primary call controller is down.

System Technician-Demanded Tests: Descriptions and Error Codes

There are no System Technician-Demanded Tests associated with this MO.

MG-VOIP (MM760 MED PRO DSP PORT)

S8700 / S8500 / S8300 / G700

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run*	Full Name of MO
MG-VOIP	MINOR/WARNING	**test port *location*[1] [short/long] [repeat#] | [clear]**	Voice Over IP

1 For information on specifying a ***location***, see Command Syntax on page 179.

The MM760 Media Module provides the audio bearer channels for voice over IP calls, and is under control of the G700. One MM760 Media Module has one VOIP-MM media processing resource. Based on system administration of audio codecs, a VOIP-MM can handle either 64 or 32 simultaneous channels of H.323 audio processing. If the **ip-parameters** form specifies only G.711 mu-law or G.711 a-law as the audio codecs, the VOIP-MM can service 64 channels. If any other codec type (G.723-5.3K, G.723-6.3K, or G.729) is administered, the VOIP-MM can only service 32 channels.

Error Log Entries and Test to Clear Values

Table 577: VOIP-MM Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0*	0	Any	Any	Any	test board GGGVSpp
257(a)	65535	Control Channel Loop Test (#52)	MINOR	ON	test board GGGVSpp l r 2

*Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Note:

- **Error Type 257** - is associated with the Control Channel Loop Test (#52).

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented in the following table. By clearing error codes associated with the *Control Channel Loop Test*, for example, you may also clear errors generated from the other test in the testing sequence.

Table 578: System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND*
Control Channel Loop Test (#52)		X	ND

*D = Destructive; ND = Nondestructive

Control Channel Looparound Test (#52)

This test queries the Media Module for its vintage to verify angel communication.

Table 579: TEST #52 Control Channel Looparound Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The Media Module failed to return the Media Module code or vintage. Retry the command a maximum of 5 times. If the problem continues, replace the Media Module. Retry the command.
	PASS	Communication with this Media Module is successful.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. If the board was found to be correctly inserted in step 1, then issue the **busyout board GGGVS** command. Issue the **reset board GGGVS** command. Issue the **release board GGGVS** command. Issue the **test board GGGVS long** command. This should re-establish the linkage between the internal ID and the port.

MIS (Management Information System)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
MIS	WARNING	**release mis**	Management Information System

Use the Management Information System (MIS)/Call Management System (CMS) to monitor MIS busyouts during administration of MIS translations. There are no hardware failures associated with this MO.

NOTE:
S8100: To diagnose MIS link hardware errors and alarms, see PKT-INT (Packet Interface).

The MIS/CMS is an adjunct processor that collects Automatic Call Distribution (ACD) data sent from the switch. In order to change MIS translations, enter **busyout mis** at the G3-MT. When the MIS is busied out, the switch stops sending ACD data to the MIS, and a Warning alarm is raised.

When the **busyout mis** is complete, enter **release mis** at the terminal. This clears the Warning alarm and allows the switch to send ACD data to the MIS.

Error Log Entries and Test to Clear Values

Table 580: Management Information System Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	release mis
18[2]	0	busyout mis	WARNING	ON	release mis

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 When **busyout MIS** is issued, no data is sent to the MIS/CMS regardless of the link state. To allow data to be sent to MIS/CMS, enter **release mis** at the terminal.

MMI-BD

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MMI-BD	MAJOR	**test board *location* l r#**	Multimedia Interface circuit pack
MMI-BD	MINOR	**test board *location* l r#**	Multimedia Interface circuit pack
MMI-BD[2]	WARNING	**test board *location* s r#**	Multimedia Interface circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 Refer to XXX-BD (Common Port Board).

Two circuit packs can be used for multimedia connections:

- ''TN787D (or later)''
- ''TN2207/Expansion Services Module''

TN787D (or later)

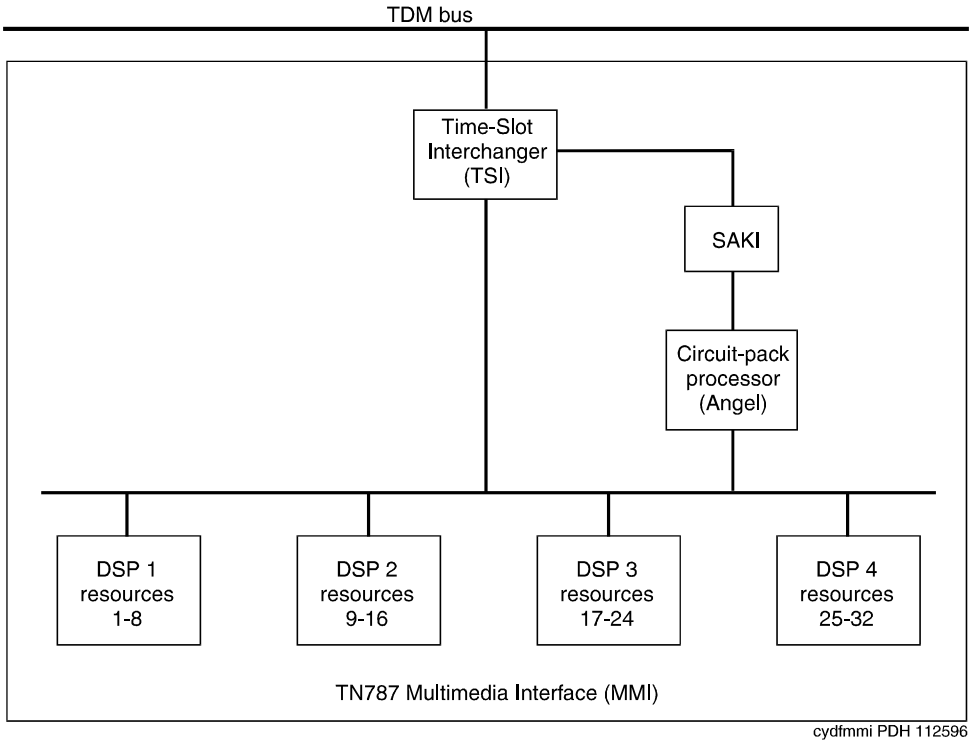
The Multimedia Interface circuit pack (TN787D or later, also called the MMCH circuit pack) provides a number of H.221 protocol terminations for bit streams received from the TDM bus. The Multimedia Interface demultiplexes the H.221 bit stream (audio, video, data, control, and indication signals) and transmits the bit streams onto the TDM bus so that the appropriate circuit packs can process them.

The Multimedia Interface circuit pack is commonly referred to as the MMI pack for H.221 protocol termination. There are 32 ports (also called resources) on the circuit pack. See MMI-PT on page 1309 for maintenance of these resources.

The MMI circuit pack contains 4 digital signal processors that manage the 32 resources.

NOTE:
Refer to Troubleshooting Multimedia Call Handling (MMCH) in Maintenance Procedures (555-245-103) for MMCH troubleshooting information.

Figure 96: TN787 Multimedia Interface (MMI) Circuit Pack



TN2207/Expansion Services Module

The TN2207 circuit pack permits connecting an ESM (Expansion Services Module). See Figure 97, Typical ESM connections, on page 1301 for connectivity.

- The TN2207 circuit pack provides T.120 data-sharing capability on a MMCH multipoint H.320 video conference
- Each conference participant must have endpoints administered and a personal computer with the H.320 video application installed.
- The S8700 Media Server configuration must have an expansion service module installed.

Figure 97: Typical ESM connections

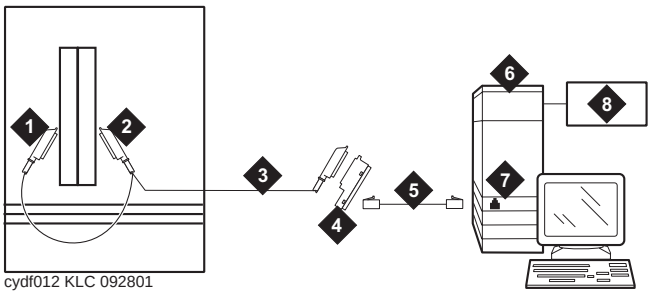


Figure Notes

1 Port B Y-cable connector to a TN787 MMI (Multimedia Interface) circuit pack

2 Port A Y-cable connector to a TN2207 PRI circuit pack

3 25-pair Y-cable

4 356A adapter

5 D8W cord connected to 356A adapter port 1

6 Expansion Service Module (ESM)

7 Port B on compatible PRI (primary rate interface) card

CAUTION:
The TN2207 circuit pack is the only pack that allows connection of an ESM to S8700 Media Server configurations.

Error Log Entries and Test to Clear Values

Table 581: MMI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board *UUCSS* sh r 1
1 (a)	Any	None	MINOR	ON	
18 (b)	0	busyout board UUCSS	WARNING	OFF	release board *UUCSS*
217 (c)	0	None	WARNING	ON	
257 (d)	65535	Control Channel Loop test (#52)	MINOR	ON	test board *UUCSS* r 3
513 (e)	4352 to 4357	Uplink error from pack			
769 (f)	Any	MMI Synchronization Status test (#1123)			
1281 (g)	Any	Circuit Pack Restart test (#594)	MAJOR	ON	

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Table 581: MMI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1538 (h)	Any	Software detected error	MINOR	ON	
1793 (i)	Any	TSI XTalk (#6)	MINOR	ON	test board *UUCSS* l r 3
2049 (j)	Any	TSI Loop (#1108)	MAJOR	ON	test board *UUCSS* l r 3

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a The circuit pack stopped functioning or it was physically removed from the system. The alarm logs approximately 11 minutes after the circuit pack has been removed and/or the SAKI Sanity test (#53) fails.

If the circuit pack is in the system and the red LED is on, follow the instructions for a red alarm in Circuit pack LEDs on page 27.

b The circuit pack was busied out using **busyout board *UUCSS***.

c There are more than four MMI circuit packs in the system. Remove the circuit pack that generated the error in the error log by locating the slot indicated by the error.

d There are transient communication problems between the switch and this circuit pack. Execute **test board *UUCSS*** and see the repair procedures for the Control Channel Loop-around test (#52) in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

e The circuit pack detected an Angel on-board hardware failure. The reported aux data values correspond to the following detected errors:

4352 — External RAM error
4253 — Internal RAM error
4355 — ROM Checksum error
4357 — Instruction set error

Use **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. When reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one these errors during initialization causes the circuit pack to lock up and appear insane to the system. See the repair procedures in Note a for Error Type 1.

f This MMI circuit pack reported a loss of MMI synchronization. Refer to Test #1123 for repair procedures.

g A failure of the time slot interchanger was detected. Reset the circuit pack using **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. If the reset passes, then the on-board circuitry is healthy. Retire the alarm using **test board *UUCSS* long clear** followed by **release board *UUCSS***.

h The circuit pack is hyperactive and it is flooding the switch with messages sent over the control channel. The circuit pack is taken out-of-service when a threshold number of these errors is reported to the switch. Clear the alarm using **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long clear**, and **release board *UUCSS***. If the error recurs within 10 minutes, replace the circuit pack.

i The TSI Cross Talk test (#6) failed. See the description of this test, and follow its repair procedures.

j The TSI Loop-around test (#1108) failed. See the description of this test, and follow its repair procedures.

System Technician-Demanded Tests: Descriptions and Error Code

Always investigate tests in the order presented when inspecting errors in the system. By clearing error codes associated with the first test, you may also clear errors generated from other tests in the sequence.

Table 582: System Technician-Demanded Tests: MMI-BD

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
TSI Crosstalk test (#6)		X		ND
TSI Loop-around test (#1108)		X		ND
MMI SYNC Status test (#1123)	X			ND
MMI SYNC Status test (#1122)		X		ND
Control Channel Loop-around test (#52)[2]	X	X		ND
SAKI Sanity test (#53)[2]			X	D

1 D = Destructive, ND = Nondestructive

2 Refer to the repair procedure described in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for a description of this test.

TSI Crosstalk Test (#6)

This test is nondestructive.

The Time Slot Interchanger (TSI) chip controls connectivity to the TDM bus. The TSI Cross Talk test verifies that this TSI talks on the selected TDM bus time slot and never crosses over to time slots reserved for other connections. If the TSI is not working correctly, one-way and noisy connections may occur. If the test passes, then the TSI can communicate over the TDM bus. This test is part of the circuit pack's demand and scheduled long test sequence, and takes approximately 20 to 30 seconds to complete.

Table 583: Test #6 TSI Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. This is an abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test, the traffic load on the system is very high, or the time slots are out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times.

1 of 2

Table 583: Test #6 TSI Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone detector for the test. The system is oversized for the number of tone detectors present, or some tone detectors are out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received from the MMI-BD circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack if the other ports are idle. Reset the circuit pack by issuing **busyout board *PCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error. This is an abnormal abort.
2100	ABORT	Could not allocate the necessary resources to run this test. This is an abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The TSI was found to be transmitting in error. This causes noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The TSI is correctly using its allocated time slots.

2 of 2

TSI Loop-Around Test (#1108)

This test is nondestructive.

During this test, the MMI's Time Slot Interchanger (TSI) is listens to a TDM timeslot. A digital count tone loops back in the TSI and onto another TDM timeslot without passing through any resource hardware. A tone detector port verifies the looped data. If the digital count is correct, then the test passes. The test is done for both TDM buses. Failures indicate that the TSI is unreliable.

Table 584: Test #1108 TSI Loop-Around Test *1 of 2*

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. This is an abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 584: Test #1108 TSI Loop-Around Test *2 of 2*

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. Either the traffic load on the system is very high or time slots are out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone detector for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received from the Tone Detector circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack (if the other ports are idle). Reset the circuit pack by issuing **busyout board *UUCSSpp***, **reset board *UUCSSpp***, and **release board *UUCSSpp***. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error. This is an abnormal abort.
2100	ABORT	Could not allocate the necessary resources to run this test. This is an abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The TSI was found to be transmitting in error, causing noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The TSI is correctly using its allocated time slots.

2 of 2

MMI Synchronization Status Test (#1122 and 1123)

This test is nondestructive.

To support applications involving multiple MMI circuit packs, the appropriate MMI circuit packs must be synchronized with one another. One such circuit pack is designated as the master sync source, which provides the synchronization signal onto the TDM bus. The other MMI circuit packs in the system listen to this signal.

This test monitors this synchronization state. The test fails if the MMI circuit pack is not in sync. The test passes with auxiliary code 1100 if the MMI circuit pack is in sync and is providing the synchronization signal for the system. The test also passes with an auxiliary code of 1101 if the MMI circuit pack is in sync and listening to the sync signal. MMI circuit packs do not lose the synchronization

signal unless an MMI circuit pack is either pulled out of the system or reset by using a technician command.

Test #1122 runs when the **long** option of **test board** is entered, initiating the recovery of synchronization. Test #1123 runs when the **short** option of **test board** is entered, giving the status of the synchronization. The **long** option is not required, because synchronization signal recovery should take place within software running in the background. Use the **long** option only if synchronization is not established within 5 minutes of investigating the problem.

Table 585: Test #1122/1123 MMI Synchronization Status Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. This is an abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	A response to the test was not received from the MMI circuit pack within the allowable time period. **1** If this result occurs repeatedly and the MMI circuit pack is idle, reset the circuit pack using **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** Rerun the test; if the same result occurs again, replace the MMI circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary resources to run this test. This is an abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The MMI circuit pack is out of MMI synchronization. Run the **long** option of the **test board** command. **1** Wait up to 5 minutes, and then reset the circuit pack with **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** Rerun the test; if the same result occurs again, replace the circuit pack.
1100	PASS	The MMI circuit pack is providing the synchronization correctly. This MMI circuit pack is designated as the Master Sync source.
1101	PASS	The MMI circuit pack is listening to the synchronization signal correctly.

Control Channel Loop-Around Test (#52)

Refer to the repair procedure described in XXX-BD (Common Port Circuit Pack) maintenance documentation as ‘‘Control Channel Loop-Around Test (#52)’’ on page 1697.

SAKI Sanity Test (#53)

Refer to the SAKI Sanity Test (#53) on page 2097 repair procedure in the XXX-BD (Common Port Circuit Pack/Media Module).

MMI-LEV (Multimedia Interface Resource Level)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
MMI-LEV	MAJOR	See Resolving MMI-LEV Errors/Alarms.	MMI-LEV

The Multimedia Interface Resource Level MO monitors MMI efficiency by tracking the number of MMI ports that are in-service, and then comparing that number with the value entered in the `MMIs` field on the System-Parameters Maintenance screen. This `MMIs` field is located under the Minimum Maintenance Threshold section. The `MMIs` field contains the minimum number of MMI ports needed for the Multimedia Call Handling (MMCH) feature to run efficiently and is an administrable field. This field must contain a minimum threshold number for MMI port capacity of between 0-128. The MMCH feature must be enabled on the System-Parameters Customer-Options screen before the `MMIs` field can be changed to a number greater than zero. The algorithm for determining that a low level of MMI resources exists uses the value entered in the `MMIs` field, and the number of MMI ports that are in-service in the system.

Each MMI circuit pack contains up to 32 ports. If the number of in-service MMI ports falls below the minimum port capacity (value entered on the System Parameters Maintenance screen under the Minimum Maintenance Threshold section and in the `MMI` field), a MMI-LEV error is logged. If this outage continues for 15 minutes, a MAJOR alarm is raised.

Resolving MMI-LEV Errors/Alarms

MMI ports are a key part of the MMCH feature, and any loss in the number of ports available for use degrades the MMCH customer-defined service level.

If a MMI circuit pack or port is busied out using **busyout board** or **busyout port**, these out-of-service ports are not included in the MMI level calculation, thus allowing a technician to busyout a MMI circuit pack for maintenance reasons without causing a MAJOR alarm to be raised. However, if every port on the MMI circuit pack is not made busy and the circuit pack is removed, an alarm is raised.

> **NOTE:**
> When diagnosing a MMI-LEV problem, begin by resolving any alarms raised against MMI-BD or MMI-PT MOs. Clearing MMI-BD or MMI-PT alarms may clear the MMI-LEV alarm.

The MMI circuit pack is maintained by the software like the Tone Detector circuit pack, which can be removed and reinserted in any port board slot without administration. Similarly, if a MMI circuit pack is removed from service logically by failing the Archangel sanity scan test or is removed from service physically by removing the circuit pack from the carrier, no error/alarm is raised against either the MMI-BD or the MMI-PT MOs. Therefore, if a MMI-LEV error/alarm exists, yet no alarms have been raised against MMI-BD or MMI-PT MOs, a MMI circuit pack may have been removed from service causing the MMI-LEV error/alarm. To resolve a MMI-LEV MAJOR alarm, restore the number of MMI ports available for service to be equal to or greater than the calculated port capacity.

To determine how many MMI circuit packs are needed for the MMCH feature:

1. Using **display system-parameters maintenance**, locate the number listed in the Minimum Maintenance Thresholds (`MMIs`) field and record this number.
2. Use **list configuration** to verify the number of MMI ports.
3. Compare this number with the value listed in the `MMIs` field on the System-Parameters Maintenance screen (number listed in step 1 a minimum thresholds number for MMI ports of between 0-128). Each MMI circuit pack contains up to 32 ports. If this number in the `MMIs` field is less than or equal to 32, one MMI circuit pack is needed. If this number is 64, then two MMI circuit pack are needed.
4. Use **list configuration** to verify that the number of MMI circuit packs listed agrees with the required minimum port capacity (from step 1). If the number of MMI circuit packs listed in the step 2 differs from the calculated number, restore the number of MMI circuit packs to the correct value, in order to resolve the MMI-LEV alarm.

Error Log Entries and Test to Clear Values

Table 586: MMI-LEV Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1[1]	Any	None	MAJOR	OFF	

1 The number of MMI resources in the system that are in service has fallen below the calculated minimum value. If the number of in-service MMI ports falls below the MMCH port capacity (value entered in the Minimum Maintenance Thresholds for MMIs field) on the System-Parameters Maintenance screen, a MMI-LEV error is logged. If this outage continues for 15 minutes, a MAJOR alarm is raised.

To resolve this alarm, correct the out-of-service problem:

1. See “MMI-PT” and “MMI-BD” and resolve any associated alarms.
2. If a MMI-LEV error/alarm exist and none has been raised against MMI-BD or MMI-PT MOs, an MMI circuit pack may have been removed from service causing the MMI-LEV error/alarm. To resolve a MMI-LEV MAJOR alarm, restore the number of MMI ports available for service to be equal to or more than the calculated port capacity. See the Resolving MMI-LEV Errors/Alarms on page 1307 section for details.
3. If the error continues to alarm, escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Code

There are no System Technician-Demanded tests for MMI-LEV.

MMI-PT

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MMI-PT	MAJOR	**test port *location* l r#**	Multimedia Interface Port
MMI-PT	MINOR	**test port *location* l r#**	Multimedia Interface Port
MMI-PT	WARNING	**test port *location* l r#**	Multimedia Interface Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
Refer to Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* for MMCH troubleshooting information.

The Multimedia Interface circuit pack provides a number of H.221 protocol terminations for bit streams received from the TDM bus. The Multimedia Interface demultiplexes the H.221 bit stream (audio, video, data, control, and indication signals) and transmits the bit streams onto the TDM bus to be processed by the appropriate circuit packs.

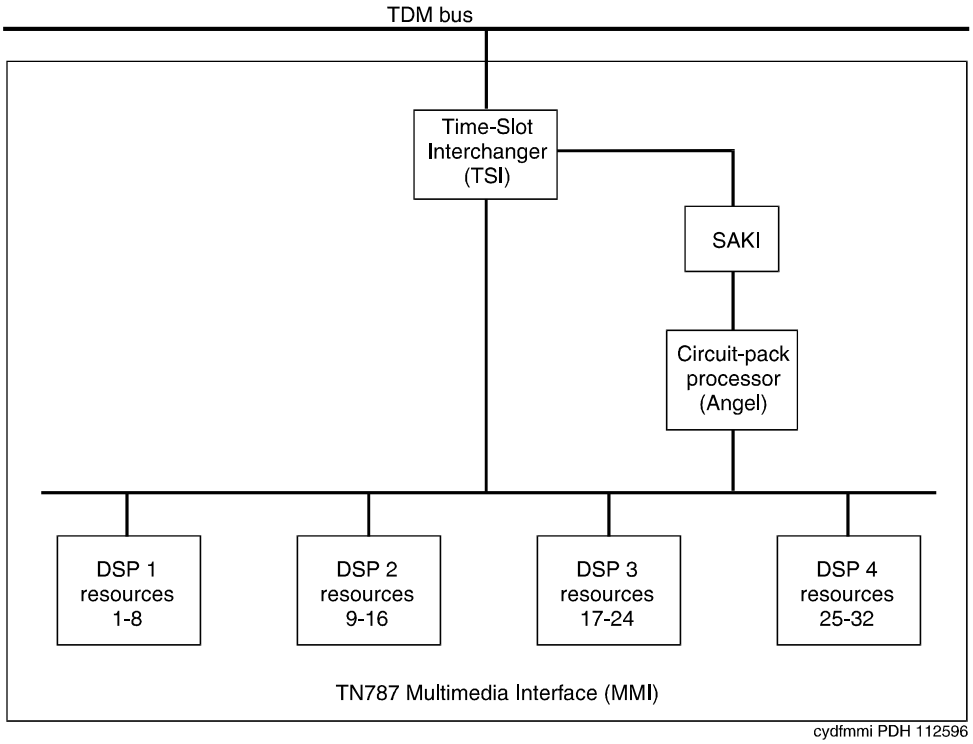
Each Multimedia Interface circuit pack contains 32 separately maintained "ports," more commonly referred to as "resources." MMI-PT represents one of these 32 resources. At system boot or when the circuit pack is inserted, 32 resources are inserted into the system.

The MMI circuit pack contains 4 Digital Signal Processors (DSPs) which manage the 32 resources. These resources are directly mapped to DSPs:

Resource	Direct Map
1–8	DSP1
9–16	DSP2
17–24	DSP3
25–32	DSP4

All 8 resources that the circuit pack controls may be placed out of service by the failure of one of these DSPs.

Figure 98: TN787 MMI (MULTIMEDIA INTERFACE) CIRCUIT PACK



Error Log Entries and Test to Clear Values

Table 587: MMI-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port UUCSSpp sh r 1
1 (a)	Any	Uplink error from pack			
18 (b)	0	busyout port PCSSpp	WARNING	OFF	release port UUCSSpp
130 (c)	Any	Software generated	WARNING	ON	
257 (d)	Any	None	MAJOR MINOR	ON	
513 (e)	Any	Resource Loop-Back test (#1111)	MINOR	ON	test port UUCSSpp sh r 3
1025 (f)	Any	Uplink error from pack			
3841 – 3844 (g)	Any	Uplink error from pack			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a The customer endpoint connected on a conference sent too many messages to the VSP-MCU in a specified amount of time. Check **status conference** to correlate which customer had the problem. This is a customer endpoint problem, not a VSP-MCU problem.

b This port was busied out by **busyout port *UUCSSpp***.

c Indicates that the circuit pack was removed or has been insane for more than 11 minutes. To clear the error, replace or reseat the circuit pack.

d Error 257 occurs if the MMI circuit pack detects a DSP Error. Maintenance software resets the DSP when this error is received. This error is logged for all 8 resources connected to this particular DSP. If this DSP continues to fail sanity, a Minor alarm is raised. Replace the circuit pack.

e Error 513 occurs when the Resource Loop-around test (#1111) fails. Run the long test sequence, and note the results of Test #1111.

f Error 1025 occurs if either the MMI or Voice Conditioner (VC) circuit packs reports a loss of framing on the service channel between these two circuit packs. When a customer endpoint establishes a call to the VSP-MCU, a channel is established between the MMI resource and the VC port. If this channel is detected to go down by either circuit pack, an uplink message is sent. This error is then forwarded to maintenance for both circuit packs. Run the long test sequence for this MMI resource, and if any of the tests fail, follow the repair procedures for that test. If every test passes, the cause of the problem might be with the VC pack. See the "VC-DSPPT" repair procedures.

g Errors 3841 - 3844 are not related to VSP-MCU. They could be caused by network problems or from the customer endpoints. They are presented here for logging purposes only.

Code	Description
3841	CRC4 Error (FrLame checksum error)
3842	Correctable BAS (Control msg bit error – 1- or 2-bit error, correctable)
3843	Uncorrectable BAS (Control msg bit error – 3-bit error or more, not correctable)
3844	Protocol Error (H.221 Protocol error from endpoint detected)

System Technician-Demanded Tests: Descriptions and Error Codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Resource Looparound test (#1111)	X	X	D

1 D = Destructive; ND = Nondestructive

Resource Loop-Around Test (#1111)

This test is **destructive**.

This test checks the connectivity of the resource within MMI circuit pack and out to the TDM bus. The object is to test the circuitry that an H.221 bit stream comes in contact with when that stream is demultiplexed, pre-processed, written to the TDM bus and then reread (looped in the TSI), post-processed, multiplexed, and then written back to the TDM bus for verification. The video, audio, and data components of the bit stream are tested separately. If any one of these tests fails, the resource is taken out of service.

Table 588: Test #1111 Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Retry the command at 1-minute intervals up to 5 times. **2** Use **status conference** to determine if there is an active conference. If a call is active, the test cannot run until the conference call finishes.
1002	ABORT	The system could not allocate time slots for the test. The traffic load on the system may be very high, or time slots may be out-of-service due to TDM-Bus errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone detector for the test. The system is oversized for the number of tone detectors present or some tone detectors are out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The resource has been seized by a user for a valid call. Use **status conference** to verify that there is an active conference call. **1** If there are no conference calls, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received from the Tone Detector circuit pack within the allowable time period. **1** If this result occurs repeatedly, reset the circuit pack, if the other ports are idle. Reset the circuit pack by issuing **busyout board *UUCSSpp*** and **reset board *UUCSSpp***, followed by **release board *UUCSS***. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary resources to run this test. Abnormal abort. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 588: Test #1111 Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
0, 1, 2	FAIL	This resource cannot guarantee data integrity and is out-of-service. The following error codes indicate failure of a particular media loop: 0 = video 1 = audio 2 = low-speed data **1** Replace the circuit pack.
	PASS	The resource is functioning normally.

2 of 2

MMI-SYNC

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MMI-SYNC	MINOR	**test board *location* l r#**	Multimedia Interface circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
Refer to Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)* for MMCH troubleshooting information.

Each Port Network (PN) must have a TN787D or later MMI circuit pack assigned as the Multimedia Interface (MMI) master synchronization source for that PN. If one or more MMI circuit pack is administered in a PN, one MMI circuit pack is designated as the master synchronization source for every MMI circuit pack within that PN.

The MMI circuit pack generates a synchronization signal and puts that signal on the TDM bus. Other MMI packs or any other circuit pack within a PN can listen to this signal and "synchronize up" to it. The first MMI circuit pack inserted in a PN is normally designated as the master. As subsequent MMI packs are inserted, they are instructed to listen and synchronize to the time-slot of the master MMI. In the unlikely case of an MMI losing this reference, an uplink message is sent from the MMI circuit pack that lost the signal to maintenance, which also clears the "event" counter on this MMI with a downlink message. This forces the MMI circuit pack to return the current state of the synchronization signal. If the signal is still lost, then the recovery algorithm is entered. Note that during this time, the MMI circuit pack synchronizes to its internal clock, and there should be no service disruption. A loss of synchronization is usually the result of a circuit pack failure. The maintenance strategy is to switch the master source away from the bad pack to another healthy MMI circuit pack within the PN.

A synchronization switch takes place if half or more of the MMI circuit packs in a PN report a loss of synchronization. For example, a PN with two MMIs reporting a loss of sync source switches immediately, three and four MMIs switch if two report the loss, and so forth. A healthy MMI circuit pack becomes the master synchronization source providing the signal on a new timeslot. The other MMI circuit packs within the PN are instructed to listen to this new signal, and the old master stops providing the signal and now listens to the new master MMI. If an MMI is physically removed from the system, then the remaining MMIs report the loss of synchronization. The first MMI with no alarms present becomes the new master of that PN. Once a synchronization switch has occurred, another switch is not allowed for 15 minutes to avoid hyperactive switching. If every MMI has an alarm, then no switch is made.

If the MMI circuit pack that provides synchronization is craft busied out, it will not affect the PN synchronization. The signal is still provided by the busied-out pack. There is no effect on synchronization if the technician issues a release of the busied-out MMI. Synchronization is not affected by a warm start of the system (reset system 1). For every other restart (reboot through cold 2), MMI synchronization recovers during board insertion.

Error Log Entries and Test to Clear Values

Table 589: MMI-SYNC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1	Any	None			See note [1]
257	Any	None	MINOR	OFF	See note [2]

1 An MMI synchronization switch was successful. Refer to MMI-BD errors for the reason for the switch.

2 The requested MMI synchronization switch failed. Resolve every MMI-BD alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

There are no system technician-demanded tests for MMI-SYNC.

MODEM-BD (Modem Pool Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MODEM-BD	MIN	**test board *location* sh**	Modem Pool circuit pack
MODEM-BD	WRN	**test board *location* sh**	Modem Pool circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

Refer to XXX-BD (Common Port circuit pack) for circuit pack-level errors. See also MODEM-PT (Modem Pool Port) for related port information.

MODEM-PT (Modem Pool Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
MODEM-PT	MINOR	**test port *location* s**	Modem Pool Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

The Modem Pool Port provides an interface for digital and analog data communication devices or ports connected to the PBX. It may be thought of as a PBX data communications "conversion resource" because it converts analog modem signals typically used in the telephone network into digital signals that are compatible with the internal PBX network and vice versa.

There may be a number of these conversion resources available in the PBX, each assigned to an available Modem Pool Group. Only one conversion resource is used per data connection. The PBX software usually adds the conversion resource into a data connection if it determines that it is necessary for the call. Typical connections that include Modem Pool conversion resources include data calls from Analog Line or Central Office Trunk ports to any digital port or Digital Line or Trunk ports to any analog port. An example of a Data Module to Central Office Trunk connection using a Modem Pool conversion resource is shown in Figure 99, Typical Modem Pool Switched Connection with Integrated Pooled Modem, on page 1317. In the case where a local data call originates from an analog port normally used for voice service only and terminates on a digital port, a Data Origination access code must be dialed before the extension number for the Modem Pool conversion resource to be included in the connection.

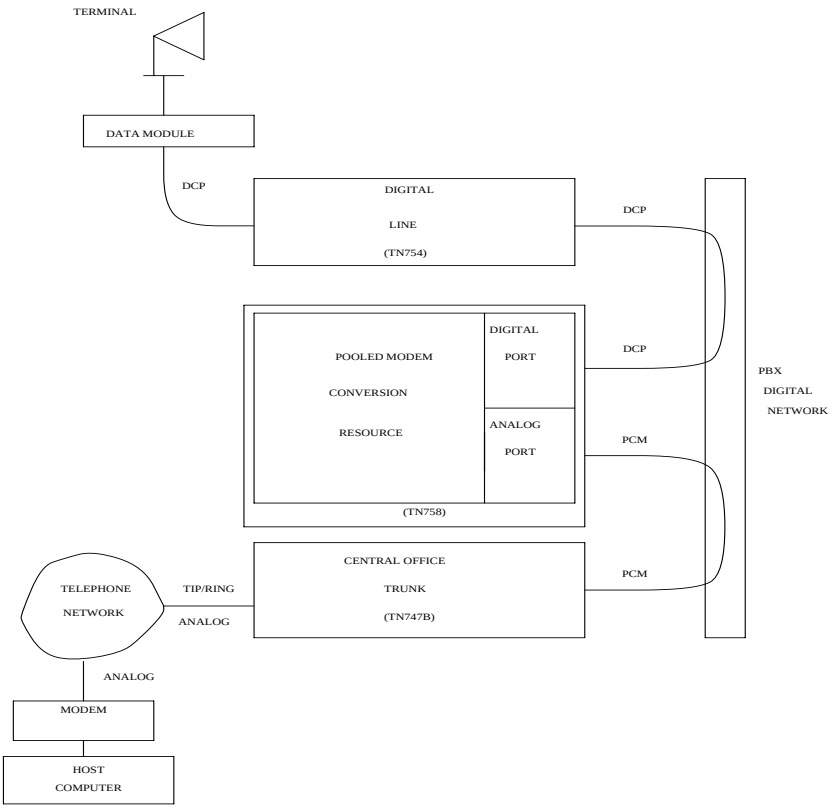
Each Modem Pool conversion resource contains two ports. One of these, an analog port, is connected (via the PBX network) to the analog line or trunk port that is the source of the modem signal. The second port is referred to as the digital port and is connected (again through the PBX network) to the digital line or trunk port associated with the Data Module in the connection. The analog modem signals enter the

analog port of the conversion resource in standard Pulse Code Modulation (PCM) format, but are converted into Data Communications Protocol (DCP) format before going to the digital line or trunk in the connection.

Integrated Modem Pools

There are two primary types of Modem Pool conversion resources available: an Integrated Pooled Modem and a Combined Modem Pool. The integrated TN758 Pooled Modem circuit pack contains two independent 300- or 1200-bps conversion resources. Each conversion resource contains two interfaces to the PBX digital network: an analog port and a digital port. The analog port is connected through the PBX network to the analog line or trunk port containing the analog modem signals. The digital port connects through the PBX network to the digital line or trunk port in the call.Figure 99, Typical Modem Pool Switched Connection with Integrated Pooled Modem, on page 1317 shows a typical end-to-end connection using a conversion resource on the integrated Pooled Modem circuit pack.

Figure 99: Typical Modem Pool Switched Connection with Integrated Pooled Modem



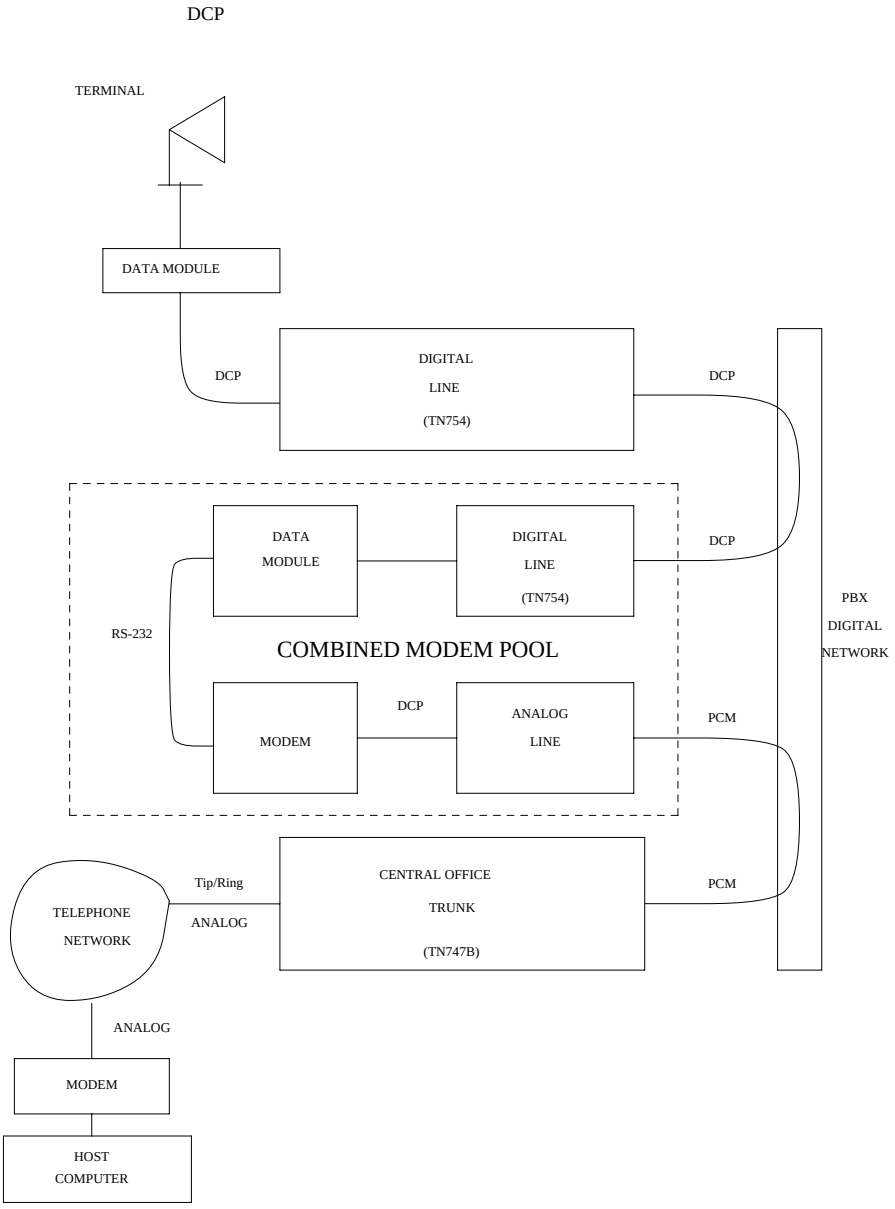
Combined Modem Pools

The Combined Modem Pool conversion resource is the second type available. The function served by the Combined Modem Pool is similar to that of the integrated Pooled Modem circuit pack, but the physical implementation is much different. It has the advantage of supporting any speed the external modem can support. The integrated Pooled Modem circuit pack can only support 300- or 1200-bps transmission

rates. The Combined Modem Pool conversion resource consists of a port on an Analog Line circuit pack, an external modem, a Data Module, and a port on a TN754 Digital Line circuit pack. The tip and ring interface of the Analog Line is connected to the modem, the RS-232C interface of the modem connects to the Data Module, and the DCP interface on the Data Module is connected to the Digital Line port.

The analog modem signals pass through the Analog Line port to the modem. The modem converts these to RS-232C signals which are passed on to the Data Module. The Data Module further converts the signals to the DCP protocol for the Digital Line port which passes the signals on to the PBX network.

Figure 100: Typical Modem Pool Switched Connection with Combined Modem Pool



Troubleshooting Modem-Pool Symptoms

Certain customer-reported troubles may provide important information for troubleshooting Modem Pool problems. For example, if the customer tries to make a data call requiring a Modem Pool conversion resource, and the Modem Pool and Data Module speeds or other options do not match, they may receive a "CHECK OPTIONS" error message on the terminal. In this case, check the Modem Pool administration and Data Module option settings. If the Modem Pool is a Combined type, check also the option settings on the external Modem and Data Module, and cabling and connections between the Digital Line port, Data Module, Analog Line port, and Modem.

Testing Modem Pools

There are three types of commands that can be used to test Modem Pool circuits: **test port, test modem-pool #,** and **test board.** The **test port** command is generally the first test to run after the Error Log is evaluated and an entry is found for a Modem Pool port. The **test modem-pool #** command runs the same tests as **test port short** performed on a Modem Pool port. However, **test modem-pool #** can automatically test every port in the Modem Pool group number specified in #. The **test board** command performs the same tests as **test port** and **test modem-pool #** plus additional tests for circuits common to the entire circuit pack. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for information about additional tests performed with **test board** (#50, #52, and #53).

If the Modem Pool port or group being tested with **test modem-pool #** contains Combined Modem Pools, the ports on the associated Analog Line circuit pack and the TN754 Digital Line circuit pack are tested as a group. Note, however, that Combined Modem Pools are not tested with the tests described in this section and the repair information related to Tests #96, 97, 98, and 99 is not applicable. The Analog port of the Combined Modem port is tested with Analog port tests, and the Digital port of the Combined Modem port is tested with TDMODULE/PDMODULE tests. Therefore, use the repair procedures outlined in the ANL-LINE, ANL-16-L, ANL-NE-L, and TDMODULE/PDMODULE Maintenance documentation when interpreting the results of the execution of **test modem-pool #** on Combined Modem Pools.

Error Log Entries and Test to Clear Values

Table 590: Modem Pool Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
18	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
130[2]		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257		Conversion Resource Loop (#98)	MINOR	ON	**test port** *UUCSSpp* **s r 3**
513		Modem Conference (#97)	MINOR	ON	**test port** *UUCSSpp* **l r 3**
769		Modem NPE Crosstalk (#96)	MINOR	ON	**test port UUCSSpp l r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 This error type indicates that the circuit pack has been removed or has been insane for more than 21 minutes. To clear the error, reinsert or replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Modem Pool Conference test (#97), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Modem Pool NPE Crosstalk test (#96)		X	D
Modem Pool Conference test (#97)		X	D
Modem Pool Conversion Resource Loop-Around test (#98)	X	X	ND
Modem Pool Audits test (#99)	X	X	ND

1 D = Destructive, ND = Nondestructive

NOTE:
The tests in this section do not apply to Combined Modem Pool conversion resources. The standard Digital Line and/or Analog Line port tests are run on the ports associated with the Combined Modem Pool. Consult the test descriptions for those MOs when repairing Combined Modem Pool arrangements.

Modem Pool NPE Crosstalk Test (#96)

This test is **destructive**.

The Modem Pool Crosstalk test verifies that the NPE is connected only to the desired time slot and is not crosstalking on other time slots. This test operates exactly like Test #6 for other types of port circuits but is performed twice in order to test both NPEs in the Modem Pool Port.

Table 591: Test #96 Modem Pool NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available. The port may be in use on a valid call. Determine whether the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times.

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Table 591: Test #96 Modem Pool NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Determine whether the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or the circuit pack, and attempt to diagnose the previously existing errors.
2000	ABORT	A response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
6000	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. **1** Wait 1 minute and attempt the test again. **2** If the same error occurs, use **status port** to determine whether the Modem Pool conversion resource is in use. **3** If the conversion resource is in use, and it is absolutely necessary to test it, the call must be dropped by issuing **busyout port *UUCSSpp*** against the conversion resource. Run the test again. **4** If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. **5** If the test continues to fail or abort, replace the Pooled Modem circuit pack and retest.
6001	ABORT	System resources needed to complete the test could not be allocated for the analog section of the Modem Pool conversion resource. Follow the test procedures for the previous error code.

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Table 591: Test #96 Modem Pool NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
None	FAIL	The test failed. This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. **1** Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. **2** If the test continues to fail, replace the Pooled Modem circuit pack and retest.
ANY	FAIL	The NPE of the tested port was found to be transmitting in error. This condition will cause noisy and unreliable connections. **1** If the remaining ports are currently idle (amber LED is off), reset the circuit pack and repeat the test. **2** If the test fails again, replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. Investigate user-reported troubles on this port using other port tests and by examining station, trunk, or external wiring.

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Modem Pool Conference Test (#97)

This test is **destructive**.

The Modem Pool Conference test checks most of the switching and gain control functions provided by the NPE circuit in the analog section of the conversion resource. This test conferences a 1004-Hz tone through the NPE, looping it back so that it can be verified with a Tone Detector circuit

Table 592: Test #97 Modem Pool Conference Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Determine whether the port is available for testing.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present, or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.

1 of 3

Table 592: Test #97 Modem Pool Conference Test

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port has been seized by a user for a valid call. Determine whether the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or the circuit pack, and attempt to diagnose previously existing errors.
2000	ABORT	The response to the test was not received in the allowable time period.
2012	ABORT	Internal system error.
2100	ABORT	System resources required for this test are not available.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times.
4000	ABORT	System resources needed to complete the test could not be allocated. Ordinarily, this means the conversion resource or other hardware used during the test was in use. **1** Wait 1 minute and attempt the test again. **2** If the same error occurs, use **status port** to determine whether the Modem Pool conversion resource is in use. **3** If the conversion resource is in use, and it is absolutely necessary to test it, the call must be dropped by issuing **busyout port *UUCSSpp*** against the conversion resource. Run the test again. **4** If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. Run the test again. **5** If the test continues to abort, replace the Pooled Modem circuit pack and retest.
65515	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** Issue **test port long** on the port on which the test aborted. If any test aborted or failed, follow recommended maintenance strategy for the appropriate port type (for example, ANL-LINE, DIG-LINE).
None	FAIL	The test failed. This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. **1** Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. **2** If the test continues to fail, replace the Pooled Modem circuit pack and retest.

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Table 592: Test #97 Modem Pool Conference Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The Network Processing Element (NPE) of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. **1** If the remaining ports are currently idle (amber LED is off), reset the circuit pack and repeat the test. **2** If the test fails again, replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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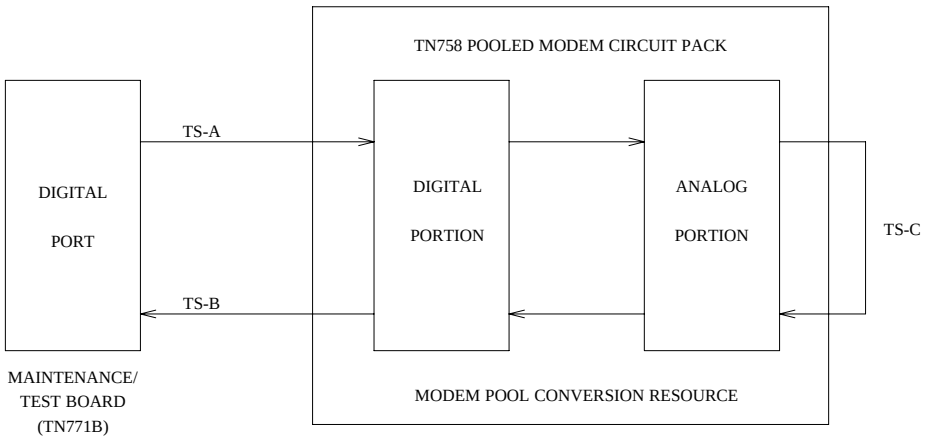
Modem Pool Conversion Resource Loop-Around Test (#98)

The Modem Pool Conversion Resource Loop-around test is set up as follows:

Figure 101: Modem Pool Conversion Resource Loop-Around



Test data patterns are transmitted from a Maintenance/Test board's digital port (**S8100**: Network Control Channel) over network time slot A through the digital port on the conversion resource, looped around through the analog port via time slot C back to the Maintenance/Test board's digital port (**S8100**: Network Control Channel) circuit via time slot B where the patterns are checked for accuracy. Finally, the test forces a disconnect by breaking the connection between the Maintenance/Test board's digital port (**S8100**: Network Control Channel) and the Modem Pool port (time slot A) and verifying that the Maintenance/Test board's digital port (**S8100**: Network Control Channel) and Modem Pool port go on-hook within the proper time. This test attempts to allocate a Maintenance/Test board's digital port (**S8100**: Network Control Channel), Modem Pool port, and other internal resources. If any of these allocation attempts fail, the test cannot be completed, and a specific abort error is reported.

Table 593: Test #98 Modem Pool Conversion Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
S8700 / S8500		
1000	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. **1** Wait 1 minute and attempt the test again. **2** If the conversion resource is in use, and it is absolutely necessary to test it, the call will have to be dropped by issuing **busyout port *UUCSSpp*** against the conversion resource. Run the test again. If the test passes, release the port. **3** If the same error occurs while the conversion resource is idle, busyout both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. Rerun the test. **4** If the test continues to abort, replace the Pooled Modem circuit pack and retest.
1180	ABORT	A Maintenance/Test board's digital port could not be allocated for this test. Since this error more closely relates to the digital ports on the specific Maintenance/Test board used than to the TN758 Pooled Modem circuit pack itself, any hardware testing or replacement activities will focus on the Maintenance/Test board. **1** Use **list config** to verify the presence of both digital ports (ports 02 and 03) on the Maintenance/Test board. The display should show entries for both. **2** If the ports are absent, see M/T-BD (Maintenance/Test Circuit Pack) on page 1338. **3** If the ports are present, retry the command at 1-minute intervals up to 5 times.
1181	ABORT	No time-slots available to connect digital ports for the test. **1** Retry the command at 1-minute intervals up to 5 times.
1182	ABORT	Internal system error. Failed to connect the digital ports with time-slots. **1** Retry the command at 1-minute intervals up to 5 times.

Table 593: Test #98 Modem Pool Conversion Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
1340	ABORT	No Maintenance/Test digital port is currently available to perform this test. **1** Use **list config** to determine whether any Maintenance/Test digital ports (ports 02 and 03 on the Maintenance/Test circuit pack) are present in the system. Because at least one Maintenance/Test circuit pack must always be present in the a PN of any Multi-Connect configuration, there should be at least two such ports present. If the ports are present, proceed to step 2. Otherwise, determine why no ports appear in the **list config** display. **2** If the ports are present and no errors are logged against them, retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, replace the Maintenance/Test circuit pack.
2004	ABORT	Off-Hook was not received from the Pooled Modem. **1** Busyout the digital port being tested on the Pooled Modem circuit pack. Retry the command at 1-minute intervals up to 5 times. **2** If the test still aborts, replace the circuit pack.
2005	ABORT	The Maintenance/Test and the Pooled Modem boards' digital ports failed to handshake. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test still aborts, replace the Pooled Modem circuit pack.
2312	ABORT	The Loop-around test did not complete, failed to receive loop-back data. **1** Retry the test, if still aborts, replace the Pooled Modem board.
2313	ABORT	The Maintenance/Test board's digital port allocated for this test did not respond to down-linked message. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, replace the MTB.
2314	ABORT	The Modem Pool digital port did not respond to downlinked message. This error is internal to the Modem Pool circuit pack and does not involve external equipment or interfaces. **1** Busyout the TN758 Pooled Modem conversion resources on the circuit pack. **2** If the test continues to abort, replace the Pooled Modem circuit pack and retest.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2323	ABORT	The Maintenance Test circuit pack digital port allocated for this test did not disconnect properly. This error is more closely related to the Maintenance Test circuit pack digital port used for this test than the TN758 Pooled Modem circuit pack itself. Therefore, any hardware testing or replacement activities will focus on the Maintenance Test circuit pack. **1** Wait 1 minute and attempt the test again up to 5 times.

Table 593: Test #98 Modem Pool Conversion Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
2324	ABORT	The digital portion of the tested Modem Pool port did not disconnect properly. **1** Wait 1 minute and attempt the test again. **2** If the test continues to abort, replace the Pooled Modem circuit pack and retest.
2325	FAIL	The Modem Pool port did not respond with an on-hook message when the connection to the TN711 Maintenance/Test digital port was broken, indicating a likely problem with the TN758 Pooled Modem circuit pack. **1** Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. **2** If the test continues to fail, replace the Pooled Modem circuit pack and retest.
	FAIL	The Loop-around test failed, the loop-back data did not match the original data. **1** Repeat Test #98. **2** If the test fails again, replace the Pooled Modem circuit pack.

S8100

Table 594: TEST #98 Modem Pool Conversion Resource Loop Around Test

Error Code	Test Result	Description/ Recommendation
NONE	ABORT	Internal System Error. **1** Wait one-minute and try the test again.
5000	ABORT	System resources needed to complete the test could not be allocated for the digital section of the Modem Pool conversion resource. Ordinarily, this means the conversion resource or other hardware used during the test was in use. **1** Wait one minute and attempt the test again. **2** If it is absolutely necessary to test the conversion resource, the call must be dropped by issuing a **busyout port *location*** command against the conversion resource. Issue the **release port *location*** command. The busyout and release of the port drop any existing calls on that port. **3** Run the test again. **4** If the same error occurs while the conversion resource is idle, busyout and release both Modem Pool conversion resources on the TN758 Pooled Modem circuit pack containing the conversion resource under test. This action drops any existing calls on that circuit pack. **5** If the test continues to abort, replace the Pooled Modem circuit pack and retest. **6** If the test continues to abort with this error code after circuit pack replacement, escalate the problem.

Table 593: Test #98 Modem Pool Conversion Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
5001	ABORT	A Network Control Channel could not be allocated for this test. This error is more closely related to the Data Channels (1 or 3 only) on the DATA-CHL circuit pack used for this test than the TN758 Pooled Modem circuit pack itself. Therefore, any hardware testing or replacement activities focus on the DATA-CHL circuit pack. However, the Data Channels on the DATA-CHL circuit pack normally should not be busied out, tested with the ‘‘test data-module’’ command, or reseated in the carrier to clear this error, since this may drop other data calls that may be active at the time. The administration of Data Channels 1 and 3 should be checked if this error occurs. **1** Wait one minute and attempt the test again. **2** If the same error persists after five attempts at one-minute intervals, escalate the problem.
5002	ABORT	The Network Control Channel allocated for this test could not be set to "maintenance busy" status. **1** Follow the repair procedures for Error Code 5001.
5003	ABORT	The test was not able to establish a connection for the digital portion of the Modem Pool Port. **1** Follow the repair procedures for Error Code 5000.
5004	ABORT	The test was not able to allocate the analog portion of the Modem Pool Port. **1** Follow the repair procedures for Error Code 5000.
5005	ABORT	The test was not able to establish a connection for the analog portion of the Modem Pool Port. **1** Follow the repair procedures for Error Code 5000.
5006	FIL	The Modem Pool Port did not respond to the "maintenance activate" message. This error is internal to the Modem Pool circuit pack and does not involve external equipment or interfaces. The test failed. This error is internal to the Pooled Modem circuit pack and does not involve external equipment or interfaces. **1** Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. **2** If the test continues to fail, replace the Pooled Modem circuit pack and retest. **3** If the circuit pack fails after replacement, escalate the problem.
5007	ABORT	The Network Control Channel allocated for this test did not respond to the incoming call indication. **1** Follow the repair procedures for Error Code 5001.

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Table 593: Test #98 Modem Pool Conversion Resource Loop-Around Test

Error Code	Test Result	Description / Recommendation
5009	ABORT	The Network Control Channel allocated for this test did not handshake correctly. **1** Attempt the test again. **2** If the same error occurs, test the DATA-CHL circuit pack using the test data-module command (refer to the DATA-CHL maintenance strategy). **3** If the DATA-CHL circuit pack tests pass, escalate the trouble report.
5010	FAIL	The Data Loop Around Test failed, indicating a probable problem with the TN758 Pooled Modem circuit pack. **1** Follow the repair procedure for Error Code 5006.
5011	ABORT	The Network Control Channel allocated for this test did not disconnect properly. **1** Follow the repair procedures for Error Code 5001.
5012	ABORT	The digital portion of the tested Modem Pool Port did not disconnect properly. **1** Follow the repair procedures for Error Code 5000.
5013	FAIL	The Modem Pool Port did not respond with an on-hook message when the connection to the Data Channel was broken, indicating a likely problem with the TN758 Pooled Modem circuit pack. **1** Follow the repair procedure for Error Code 5006.
5014	ABORT	The Network Control Channel allocated for this test did not respond correctly to the setup message sent to it after the connection was established. **1** Attempt the test again. **2** If the same error occurs, test the DATA-CHL circuit pack using the test data-module command (refer to the DATA-CHL maintenance strategy). **3** If the DATA-CHL circuit pack tests pass, escalate the problem.
5015	ABORT	Data Channels 1 and/or 3 have not been administered. **1** Administer the Data Channels and retest.
	PASS	The port can correctly transmit/receive data.

Modem Pool Audit Test (#99)

This audit updates the Modem Pool conversion resource status contained in the TN758 Pooled Modem circuit pack's microprocessor. It does not test the Pooled Modem circuit pack, so there are no FAIL codes. The audit can only be performed on idle conversion resources. If the conversion resource is in use, the audit aborts.

Table 595: Test #99 Modem Pool Audit Test

Error Code	Test Result	Description / Recommendation
None	ABORT	The system was not able to allocate every necessary resource to execute this test. An ABORT simply indicates that the conversion resource was in use when the audit was performed. No repair action is necessary unless the conversion resource was known to be idle during the test (amber in-use LED was off) or was busied out before the test was run. In that case, a TN758 failure condition may exist and the following procedure should be used: **1** Busyout both of the TN758 Pooled Modem conversion resources on the circuit pack containing the failing conversion resource. **2** If the test continues to abort, replace the Pooled Modem circuit pack and retest.

M/T-ANL (Maintenance/Test Analog Port)

S8700 / S8500 / S8100

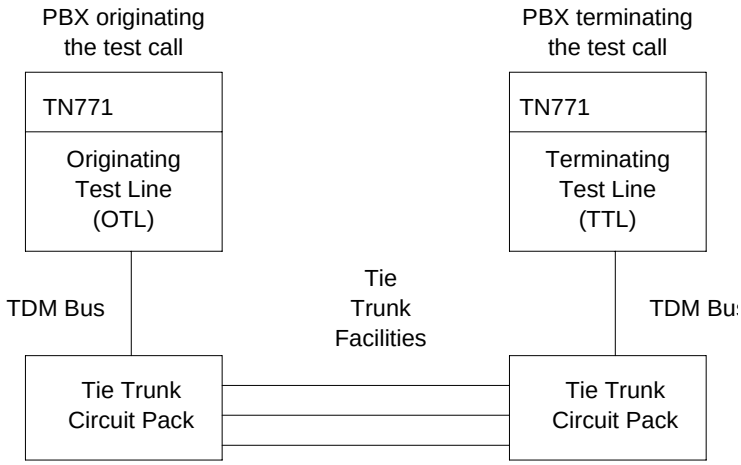
MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
M/T-ANL	Minor	**test port *location* l**	Maintenance/Test analog port
M/T-ANL	Warning	**release port *location***	Maintenance/Test analog port

1 For information on specifying a ***location***, see Command Syntax on page 179.

The Maintenance/Test analog port is port number 1 on the TN771D Maintenance/ Test circuit pack. This port is used by the Automatic Transmission Measurement System (ATMS) as an Originating Test Line (OTL) or Terminating Test Line (TTL) for test calls over analog trunks. For more details, see Automatic Transmission Measurement System in Chapter 9, "Additional maintenance procedures" in *Maintenance Procedures (555-245-103)*. Figure 67 shows a typical ATMS configuration.

M/T-ANL maintenance ensures that the analog trunk's testing function is operating correctly. Although an M/T-ANL alarm can reduce service, it will not block service. To accurately measure the performance and health of analog trunks, replace an alarmed TN771D when a new circuit pack is available.

Figure 102: ATMS Tie Trunk Test Call



Error Log Entries and Test to Clear Values

Table 596: M/T-ANL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1] (a)	0	Any	Any	Any	**test port** *UUCSSpp*
1 (b)	41018	none	MINOR	ON	**test port** *UUCSSpp* **l r 3**
18	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
257	Any	NPE Crosstalk test (#9)	MINOR	ON	**test port** *UUCSSpp* **l r 3**
513	Any	Analog Port Sanity test (#963)	MINOR	ON	**test port** *UUCSS01* **r 2**
769	Any	Analog Port Digital Loop-around test (#13)	MINOR	ON	**test port** *UUCSSpp* **r 3**
3840 (c)	Any	Hook State Inquiry test (#566)			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Error Notes:

a This error code appears in the Error Log only if the MTB circuit pack has been removed since the Error Log was last cleared. Verify that the circuit pack has been reinserted.

b This error indicates a hardware failure on the Analog Port circuitry. Replace the Maintenance/Test circuit pack if the command does not resolve the alarm.

c This error indicates that call processing records did not agree with on-board records for the hook state (on-/off-hook) of the Maintenance/Test analog port. This error is not service-affecting and no action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. For example, by clearing error codes associated with the Analog Port Sanity test (#963), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Port Sanity test (#963)	X	X	ND
Digital Loop-around test (#13)	X	X	ND
NPE Crosstalk test (#9)		X	ND
Hook State Inquiry (#566)	X	X	ND
Clear Error Counters (#270)		X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#9)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections.

One or more Network Processing Elements (NPE) reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity, gain, and provides conferencing functions on a per-port basis. If the NPE is not working correctly, one-way and/or noisy connections may be observed. This test is part of a port's long test sequence and takes approximately 10 to 20 seconds to complete.

Table 597: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid ATMS trunk test call. **1** Retry the command at 1-minute intervals up to 3 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. To view the system occupancy measurements enter **status health** on the system technician terminal. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 3 times.
1004	ABORT	The port has been seized by a valid ATMS test call. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort and the port is idle on a valid ATMS test call, escalate the problem. To determine whether the port is in use by an ATMS test call, enter **status station *ext*** where ***ext*** is the assigned ATMS station's number.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.

1 of 2

Table 597: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. **1** If the remaining ports are currently idle (amber LED is off), try to reset the circuit pack via **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. Repeat the test. **2** If the test fails again, replace circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated by examining station, trunk, or external wiring.

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Analog Port Digital Loop-Around Test (#13)

This test is a modification of the Voice and Control Channel Local Loop test used by Digital Station (DIG-LINE) maintenance. This test does not perform the control channel and secondary information channel loop around tests as described for DIG-LINE, as these data paths do not exist for the Maintenance/Test analog port. To test the primary information channel, this test:

1 Loops back the data channel onto the TDM bus

2 Sends a digital count from the Tone-Clock circuit pack and receives the same digital count with a general-purpose tone detector

3 Runs a conference test for the primary information channel. This is the same test as Conference test (#6).

Only one value (Pass, Fail, or Abort) is generated as a result of the two tests. If it fails or aborts, the sequence is stopped.

Table 598: Test #13 Analog Port Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
1000	ABORT	The port is in use on a valid ATMS test call. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort and the port is idle on a valid ATMS test call, escalate the problem. To determine whether the port is in use by an ATMS test call, enter **status station *ext*** where ***ext*** is the assigned ATMS station's number.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 598: Test #13 Analog Port Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. A system is considered under heavy traffic when the Call Processing Occupancy is greater than 50% or when the System Management and the Call Processing Occupancies together exceed 65%. To view the system occupancy measurements enter **status health** on the system technician terminal. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 3 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 3 times.
1004	ABORT	The port was seized by a valid ATMS test call. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort and the port is idle on a valid ATMS test call, escalate the problem. To determine whether the port is in use by an ATMS test call enter **status station *ext***, where ***ext*** is the assigned ATMS station's number.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
7	FAIL	Conference test failed on the primary information channel. **1** Run the circuit pack tests to check the Tone-Clock (TONE-BD) circuit pack and the Tone Detector circuit pack via **test board *UUCSS***. **2** Resolve any problems that are detected on the Tone-Clock (TONE-BD) circuit pack or Tone Detector circuit pack. See the section on Tone Generator circuit pack. **3** If the Tone-Clock and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test circuit pack.

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Table 598: Test #13 Analog Port Digital Loop-Around Test

Error Code	Test Result	Description / Recommendation
14	FAIL	The primary information channel is not transmitting properly. User may not notice any interruption in service or may not be able to use this port. **1** Run the circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using **test board *UUCSS***. **2** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. See the section on Tone Generator circuit pack. **3** If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test circuit pack.
	PASS	The Maintenance/Test analog port analog trunk testing capability is operating correctly.

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Clear Error Counters (#270)

The ports on the Maintenance/Test circuit pack continually run self-tests, whenever the port is idle. The Angel uses a counter so that the Background Maintenance Failure message is only sent uplink once. Many circuit packs have counters in the Angel firmware. These counters are used so that Control Channel Message Set (CCMS) messages are not continuously sent uplink. Using this method, the message will be sent once, when the counter reaches some preset threshold, and then not sent again until the counter is cleared. This test is used to clear the counter, so that if the port continues to fail during or after Communication Manager demands testing, the Angel will send a message to indicate that fact.

This test is only used to send a message to the Angel on the Maintenance/Test circuit pack. Therefore, this test should never abort or fail.

Table 599: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
	PASS	The message to clear the Maintenance/Test circuit pack's counter for Background Maintenance Failures has been sent.

Hook State Inquiry (#566)

This test ensures that the Maintenance/Test analog port maintenance software and call processing agree on the on-/off-hook status of the Maintenance/Test analog port.

Table 600: Test #566 Hook State Inquiry

Error Code	Test Result	Description / Recommendation
1	ABORT	Switch hook audit timed out. No response was received from the circuit pack for information about the switch hook state. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to abort, replace the circuit pack and repeat the test.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.
Any	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 3 times. **2** If the test continues to fail reset the circuit pack via **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **3** Retry the command at 1-minute intervals up to 3 times.
	PASS	Call processing and Maintenance/Test analog port maintenance software agree on the Maintenance/Test analog port hook state.

Analog Port Sanity Test (#963)

This test verifies that the port circuitry involved in the analog trunk testing on the Maintenance/Test analog port is functioning properly.

This test will abort if an ATMS test call is in progress on the Maintenance/Test analog port when the test is requested.

Table 601: Test #963 Analog Port Sanity Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	An internal operation failed; the test could not be completed. **1** Retry the command at 1-minute intervals up to 3 times.
50	FAIL	The switch was unable to communicate with the port circuitry used for analog trunk testing. **1** Reset the circuit pack via **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** Test the port again via **test port *UUCSS*01 l**. **3** If the test fails again, replace the circuit pack.
	PASS	The Maintenance/Test analog port analog trunk testing capability is operating correctly.

M/T-BD (Maintenance/Test Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
M/T-BD	MINOR	**test board *location* l**	Maintenance/Test circuit pack
M/T-BD	WARNING	**release board *location***	Maintenance/Test circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The Maintenance/Test circuit pack supports packet-bus fault detection and bus reconfiguration for the port network where it is installed. The circuit pack also provides Analog Trunk testing, and data loop-back testing of DCP Mode 2 endpoints and Digital (ISDN) Trunk facilities via the TDM bus.

Port 1 of the Maintenance/Test board is the Analog Test port which provides the Analog Trunk testing function for Automatic Transmission Measurement System (ATMS). ATMS is a feature in which calls are made from a device called an Originating Test Line (OTL) over a specific trunk to a device called a Terminating Test Line (TTL). The OTL and TTL can then send tones over the trunk under test and determine the quality of the connection. Ports 2 and 3 are the digital ports which provide the digital (ISDN) trunk-testing functions. Port 4 is the packet port which provides the packet-bus maintenance function.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit pack-level errors. See also, related maintenance/test information for analog, digital, and packet-bus ports:

- M/T-ANA (Maintenance/Test analog port)
- M/T-DIG (Maintenance/Test digital port)
- M/T-PKT (Maintenance/Test packet-bus port)

Every port except the analog port (Port 1) of the Maintenance/Test board is automatically administered when the circuit pack is inserted into the system and automatically removed when the circuit pack is unplugged from the system. The Analog port however, is administered via the station screen with the type "105TL" for an OTL or a TTL. This port remains administered even after the circuit pack is physically removed from the system. Care should be taken to remove the OTL or the TTL before unplugging the circuit pack.

Hardware Error Log Entries and Test to Clear Values

Maintenance/Test Board Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level[1]	On/Off Board	Test to Clear Value
0[2]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	0	SAKI Sanity test (#53)	MINOR	ON	See Note a.
18 (b)	0	**busyout board**	WARNING	OFF	**release board** *UUCSS*
36 (c)	0				
217 (e)			WARNING	ON	
257 (d)	0	CC Loop test (#52)	MINOR	ON	**test board** *UUCSS* **r3**
267 (e)			WARNING	ON	
513 (f)	4352 to 4357				
769 (g)	4358				
1025 (h)	4363	NPE Audit test (#50)			**test board** *UUCSS* **l**
1538 (i)	0		MINOR	ON	
3840 (j)	4096 to 4101				
3999 (k)	Any	None			

1 Major or Minor alarms on this MO may have been downgraded to Warning based on the values in **set options**.

2 Run the short test sequence. If the tests pass, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a Error 1 indicates that the circuit pack has stopped functioning. Reset the circuit pack via **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. the SAKI Sanity test (#53) passes, the on-board circuitry is healthy. If the SAKI Sanity test (#53) fails, replace the circuit pack.

b The circuit pack has been busied out via **busyout board *UUCSS***. Execute **release board *UUCSS***.

c A port processor on the circuit pack failed to initialize. Reset the circuit pack via **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. If the problem does not go away, replace the circuit pack.

d A Control Channel Protocol error has occurred. This may be due to the circuit pack detecting an on-board hardware failure. Execute **busyout board *UUCSS*** and **reset board *UUCSS*** to reset the circuit pack. Any such problem will be detected during initialization, because the circuit pack locks up and appears insane to the system.

e An extra TN771D circuit pack has been inserted into the port network.

f An on-board hardware failure has been detected by the circuit pack. Enter the **busyout board UUCSS**, **reset board UUCSS**, and **release board UUCSS** commands to reset the circuit pack. If the SAKI Sanity test (#53) passes, the circuitry is healthy. If not, replace the circuit pack.

g Error 769 is reported by the circuit pack when it detects a program logic error. No action is required. This error may lead to errors of other types being reported against this circuit pack.

h This error is reported by the circuit pack when it cannot update NPE memory and read it back. This error type can be ignored, but may lead to errors of other types being reported against this circuit pack.

i Excessive number of messages have been received from the Maintenance/Test circuit pack. This may be due to a hardware problem on the circuit pack. The switch takes the board out of service and periodically puts it back into service to see if the problem has disappeared. If the problem persists, replace the circuit pack.

j This error is not service affecting. No action is required. This error is reported by the circuit pack when it receives a bad control channel message from the switch.

k Error type 3999 indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If error type 1538 is absent, then the circuit pack was not taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the Control Channel Loop-Around test (#52), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-Around test (#52)	X	X	ND
NPE Audit test (#50)		X	ND

1 D = Destructive, ND = Nondestructive

Repair procedures for the above tests are described in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

M/T-DIG (Maintenance/Test Digital Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
M/T-DIG	MINOR	**test port *location* l**	Maintenance/Test digital port
M/T-DIG	WARNING	**release port *location***	Maintenance/Test digital port

1 For information on specifying a ***location***, see Command Syntax on page 179.

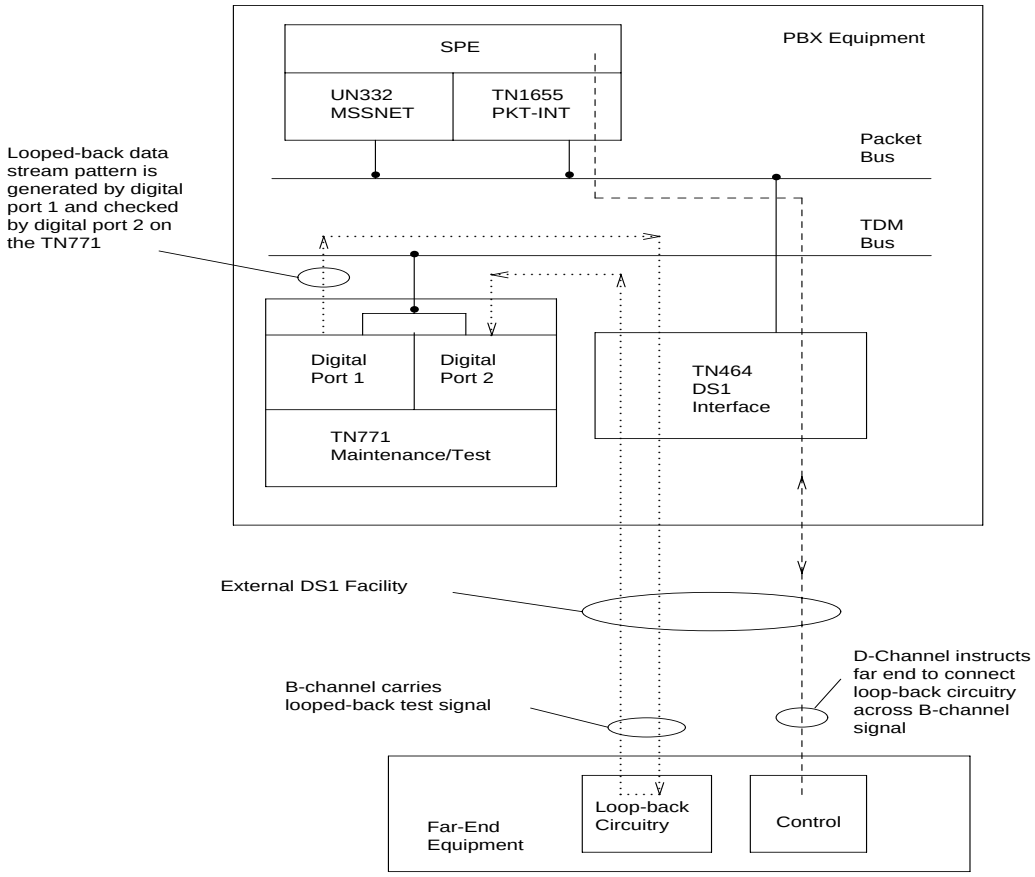
The Maintenance/Test digital port is a port on the TN771D circuit pack. Ports 2 and 3 are digital ports. The Maintenance/Test digital port provides the ability to perform digital (i.e., ISDN-PRI) trunk testing via the TDM bus. For an ISDN-PRI test call, connections are set up in the system as shown in Figure 103, ISDN-PRI Outgoing Test Call, on page 1342.

When the Maintenance/Test digital port is participating in an ISDN-PRI test call, the port sends a stream of pseudo-random data along the connected B channel. The far end loops back this data, and the Maintenance/Test digital port compares the data to that which was sent. Errors are recorded on a bit and block basis. Refer to ISDN-TRK (DS1 ISDN Trunk) Maintenance documentation for more information about ISDN-PRI test calls.

The Maintenance/Test digital port maintenance ensures that the digital trunk testing function is operating correctly. The Maintenance/Test digital port is alarmed if maintenance determines that the digital port is operating incorrectly.

NOTE:
An alarm on the Maintenance/Test digital port reduces service, but does not block it since the ISDN-TRK has other means to determine the health of the ISDN-PRI trunk facility. However, to accurately measure the error performance and to ensure accuracy of the health of the ISDN-PRI trunk, the Maintenance/Test circuit pack should be replaced when a new circuit pack is available.

Figure 103: ISDN-PRI Outgoing Test Call



Hardware Error Log Entries and Test to Clear Values

M/T-DIG Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp*
1 (a)	41018	none	MINOR	ON	**test port** *UUCSSpp* **l r 3**
18 (b)	0	busyout port UUCSSpp	WARNING	OFF	**release port** *UUCSSpp*
257 (c)	Any	NPE Crosstalk test (#9)	MINOR	ON	**test port** *UUCSSpp* **l r 3**
513 (d)	Any	Digital Port Sanity test (#565)	MINOR	ON	**test port *UUCSS*02 r 2**
769 (e)	Any	Digital Port Loop Around test (#13)	MINOR	ON	**test port** *UUCSSpp* **r 3**
3840 (f)	Any	Hook State Inquiry test (#566)			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Error Notes:

a There was a hardware failure on a digital port's circuitry. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the command above.

b The port was busied out by **busyout port *UUCSSpp***.

c The Maintenance/Test digital port is talking on more than just its assigned time slot. Replace the Maintenance/Test circuit pack.

d The Maintenance/Test digital port has failed its self-test. Because the Digital Port Sanity test runs only on port 2, but tests both ports 2 and 3, both ports are alarmed when the test fails. The command indicates to test port 2, even if the error is logged against port 3.

e The Maintenance/Test digital port was unable to successfully loop data from a tone generator to a tone detector.

f Call processing records do not agree with on-board records for the hook state (on-/off-hook) of the Maintenance/Test digital port. This error is not service-affecting and no action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. For example, by clearing error codes associated with the Digital Port Sanity test (#565), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Port Sanity test (#565)	X	X	ND
Digital Port Loop Around test (#13)	X	X	ND
NPE Crosstalk test (#9)		X	ND
Hook State Inquiry (#566)	X	X	ND
Clear Error Counters (#270)		X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#9)

This test is a modified version of the Digital Line NPE Crosstalk test used by DIG-LINE maintenance.

One or more Network Processing Elements (NPE) reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity, gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and/or noisy connections may be observed. This test is part of a port's long test sequence and takes approximately 10 to 20 seconds to complete. This test is a modified version of the Digital Line NPE Crosstalk test used by DIG-LINE maintenance.

Table 602: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid ISDN-PRI test call. Use **list isdn-testcall** to determine whether the port is in use (listed in the M/T Port column). If so, wait for the test call to finish as indicated in the `Start Time` and `Duration` fields, or abort the test call with **clear isdn-testcall *grp/mem***, where ***grp/mem*** is determined from the `B-channel` field of **list isdn-testcall**. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.

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Table 602: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	The port has been seized by a valid ISDN-PRI test call. Use **list isdn-testcall** to determine which call is using the port (from the M/T Port column). Wait for the test call to complete as indicated in the `Start Time` and `Duration` fields of the above display, or abort the test call with **clear isdn-testcall *grp/mem***, where grp/mem is determined screen the `B-channel` field **list isdn-testcall**. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. **1** If the remaining ports are currently idle (amber LED is off), try to reset the circuit pack. Then repeat the test. **2** If the test fails again, replace circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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Digital Port Loop-Around Test (#13)

This test is a modification of the Voice and Control Channel Local Loop test used by Digital Station (DIG-LINE) maintenance. This test does not perform the control channel and secondary information channel loop around tests as described for DIG-LINE, as these data paths do not exist for the Maintenance/Test digital port. The primary information channel is tested by first looping back the data

channel onto the TDM bus, and then sending a digital count from the Tone-Clock circuit pack and receiving the same digital count with a general-purpose tone detector. A conference test is done next for the primary information channel. This is the same test as Conference test (#6).

Only one value (Pass, Fail, or Abort) is generated as a result of the two tests. If it fails or aborts, the sequence is stopped.

Table 603: Test #13 Digital Port Loop-Around Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1000	ABORT	The port is use on a valid ISDN-PRI test call. Use **list isdn-testcall** to determine which call is using the port (from the M/T Port column). Wait for the test call to complete as indicated in the `Start Time` and `Duration` fields, or abort the test call with **clear isdn-testcall *grp/mem***, where grp/mem is determined from the `B-channel` field of **list isdn-testcall**. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid ISDN-PRI test call. Use **list isdn-testcall** to determine which call is using the port (from the M/T Port column). Wait for the test call to complete as indicated in the `Start Time` and `Duration` fields of the above display, or abort the test call with **clear isdn-testcall *grp/mem***, where grp/mem is determined from the `B-channel` field of **list isdn-testcall**. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.

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Table 603: Test #13 Digital Port Loop-Around Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the test at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
7	FAIL	Conference test failed on the primary information channel. In most cases, the user may not notice a disruption in service. **1** Run the circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack via **test board *UUCSS***. **2** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. **3** If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test circuit pack.
14	FAIL	The primary information channel is not transmitting properly. User impact may range from nothing to not being able to use this port. **1** Run the circuit pack tests to check the Tone Generator circuit pack and the Tone Detector circuit pack using **test board *UUCSS***. **2** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. **3** If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Maintenance/Test circuit pack.
	PASS	The Maintenance/Test digital port digital trunk testing capability is operating correctly.

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Clear Error Counters (#270)

This test is not an actual test in the strict sense of the word. Many circuit packs have counters in the Angel firmware. These counters are used so that Control Channel Message Set (CCMS) messages are not continuously sent uplink. Using this method, the message will be sent once, when the counter reaches some preset threshold, and then not sent again until the counter is cleared.

The ports on the Maintenance/Test circuit pack continually run self-tests, whenever the port is idle. The Angel uses a counter so that the Background Maintenance Failure message is only sent uplink once. This test is used to clear the counter, so that if the port continues to fail during or after Communication Manager demanded testing, the Angel will send a message to indicate that fact.

This test is only used to send a message to the Angel on the Maintenance/Test circuit pack. Therefore, this test should never abort or fail.

Table 604: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
Any	ABORT	This test should never abort.
Any	FAIL	This test should never fail. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
	PASS	The message to clear the Maintenance/Test circuit pack's counter for Background Maintenance Failures has been sent.

Digital Port Sanity Test (#565)

This test verifies that the port circuitry involved in the digital trunk testing on the Maintenance/Test digital port is functioning properly. This circuitry is common to both Maintenance/Test digital ports on the Maintenance/Test circuit pack. Therefore, this test is only run for port 2. The test aborts when it is run on port 3, as described in Table 605, Test #565 Digital Port Sanity Test, on page 1348.

The Digital Port Sanity Test (#565) operates by connecting the two Maintenance/Test digital ports on the TDM bus so that they talk and listen to each other. Four self-tests are attempted:

- sending data from port 2 to port 3 in asynchronous mode
- sending data from port 3 to port 2 in asynchronous mode
- sending data from port 2 to port 3 in synchronous mode
- sending data from port 3 to port 2 in synchronous mode

The test passes if all four self-tests are successful. The test stops when any one of the self-tests fails.

This test aborts if an ISDN test call is in progress on the Maintenance/Test digital port when the test is requested, or if an ISDN test call is initiated while the Digital Port Sanity test is in progress.

Table 605: Test #565 Digital Port Sanity Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	One of the Maintenance/Test digital ports is busy with background maintenance. **1** Either wait for the port to become idle, or busyout both Maintenance/Test digital ports on the Maintenance/Test circuit pack via **busyout port *UUCSS*02** and **busyout port *UUCSS*03**. **2** Release the ports (if they were busied out) via **release port *UUCSS*02** and **release port *UUCSS*03**. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, escalate the problem.

Table 605: Test #565 Digital Port Sanity Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors, and if not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1004	ABORT	The port was seized by a valid ISDN-PRI test call. Use **list isdn-testcall** to determine which call is using the port (from the M/T Port column). Wait for the test call to complete as indicated in the `Start Time` and `Duration` fields, or abort the test call with **clear isdn-testcall *grp/mem***, where ***grp/mem*** is determined from the `B-channel` field of **list isdn-testcall**.
1019	ABORT	An ISDN test call is in progress using this Maintenance/Test circuit pack. The Maintenance/Test circuit pack cannot perform a self-test on one of its digital ports while an ISDN test call is using either of the digital ports. Use **list isdn-testcall** to determine which call is using the port, from the M/T Port column. Wait for the test call to complete as indicated in the `Start Time` and `Duration` fields, or abort the test call with **clear isdn-testcall *grp/mem***, where ***grp/mem*** is determined from the `B-channel` field of **list isdn-testcall**. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
1138	ABORT	This test does not run on port 3 of the Maintenance/Test circuit pack. This test will only run on port 2. Look at the results of the Digital Port Sanity test for port 2. **1** Run the command again for port 2 via **test port *UUCSS*02** or **test port *UUCSS*02 l**
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available.
2500	ABORT	An internal operation failed; the test could not be completed. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
50	FAIL	The switch was unable to communicate with the port circuitry used for digital trunk testing.
100	FAIL	Data was not sent from port 2 to port 3 successfully in asynchronous mode.
101	FAIL	Data was not sent from port 3 to port 2 successfully in asynchronous mode.
102	FAIL	Data was not sent from port 2 to port 3 successfully in synchronous mode.
103	FAIL	Data was not sent from port 3 to port 2 successfully in synchronous mode. **1** Reset the circuit pack via the **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** Test the port again via **test port *UUCSS*02 l**. **3** If the test fails again, replace the circuit pack.

2 of 3

Table 605: Test #565 Digital Port Sanity Test

Error Code	Test Result	Description / Recommendation
	PASS	The Maintenance/Test digital port digital trunk testing capability is operating correctly.

3 of 3

Hook State Inquiry (#566)

This test ensures that the Maintenance/Test digital port maintenance software and call processing agree on the on-/off-hook status of the Maintenance/Test digital port.

Table 606: Test #566 Hook State Inquiry

Error Code	Test Result	Description / Recommendation
1	ABORT	Switch hook audit timed out. No response was received from the circuit pack for information about the switch hook state. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, replace the circuit pack and repeat the test. **3** If the test continues to abort, escalate the problem.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
Any	FAIL	Internal system error. This test should never return a failure. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, reset the circuit pack via **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **3** Retry the command at 1-minute intervals up to 5 times. **4** If the test continues to fail, escalate the problem.
	PASS	Call processing and Maintenance/Test digital port maintenance software agree on the Maintenance/Test digital port hook state.

M/T-PKT (Maintenance/Test Packet Bus Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
M/T-PKT	Minor	**test port *location* l**	Maintenance/Test Packet Bus port
M/T-PKT	Warning	**release port *location***	Maintenance/Test Packet Bus port

1 For information on specifying a ***location***, see Command Syntax on page 179.

The Maintenance/Test packet-bus port (M/T-PKT) is Port #4 on the TN771D Maintenance/Test circuit pack. The packet-bus port provides the following packet-bus maintenance functions:

- Packet-bus fault detection

  The ability to detect faults (e.g., shorts, open leads) on the packet bus autonomously (i.e., without Communication Manager involvement).

- Packet-bus reconfiguration

  The ability to swap faulty leads with spare leads autonomously so that the packet bus remains operational. This is accomplished by sending a message to every circuit pack using the packet bus (e.g., TN556 ISDN-BRI), telling it which spare leads to use on the bus.

M/T-PKT maintenance ensures that these maintenance functions are operating correctly. The Maintenance/Test packet-bus port is alarmed if maintenance determines that the port's maintenance functions are operating incorrectly.

When M/T-PKT maintenance determines that the packet-bus port is defective, the packet-bus fault-detection and -reconfiguration functions provided by the port will be turned off.

M/T-PKT maintenance interacts with packet-bus maintenance. Therefore, there may be alarms on the packet bus when there is a fault on the M/T-PKT. For further information, refer to the PKT-BUS MO's section.

Hardware Error Log Entries and Test to Clear Values

M/T-PKT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp*
1 (a)	41018	none	MINOR	ON	**test port** *UUCSSpp* **l r 3**
18 (b)	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
257 (c)	Any	none	MINOR	ON	
513 (d)	Any	Packet Bus Port Health Inquiry test (#567)	MINOR	ON	**test port** *UUCSSpp* **r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Error Notes:

a Error Type 1 indicates a hardware failure with the port circuitry which provides the packet-bus maintenance functions. Replace the Maintenance/Test circuit pack if the alarm is not resolved by the test command above.

b Error Type 18 indicates that the port has been busied out by **busyout port *UUCSSpp***.

c Error Type 257 indicates that the Maintenance/Test packet-bus port has reconfigured the packet bus by swapping a bad lead to a spare. Note that this error is sent up whenever the Maintenance/Test packet-bus port is initialized (since the packet-bus port reconfigures the packet bus to whatever state it determines the packet bus is in). This will occur if the circuit pack is inserted, if the system is restarted, or if the port is released from a busyout state. Therefore, it is normal for this error to be present in the error log.

If the M/T-PKT reconfigures the packet bus 6 times (**S8100**: 12 times) within 15 minutes, a Minor alarm is raised indicating that either:

- Packet-bus maintenance functions are not operating correctly
- Many changes are taking place on the packet bus (insertions or removals of circuit packs)

If the system has been in a stable state for more than 15 minutes, try the following procedure:

1. Reset the Maintenance/Test circuit pack from the G3-MT (**S8100**: Manager 1 Terminal) as follows:
   - Enter the **busyout board *UUCSS*** command.
   - Enter the **reset board *UUCSS*** command.
   - Enter the **release board *UUCSS*** command.
2. Wait 15 minutes.
3. If the error recurs, replace the Maintenance/Test circuit pack.

When this alarm is active, the amber LED will be in one of three states:

- An unlit amber LED indicates no activity on the Maintenance/Test circuit pack. You can replace the Maintenance/Test circuit pack.

- If there is an indication of an uncorrectable fault on the packet bus, the amber LED will be blinking at a rate of 1 Hz. It is OK to replace the Maintenance/Test circuit pack. Ignore the packet-bus error indication, since the Maintenance/Test circuit pack has been determined to be defective.
- If there is other activity on the Maintenance/Test circuit pack (i.e., ISDN test call), or if there is an indication of a correctable fault on the packet bus, the amber LED will be on steady. If there is an ISDN test call in progress, it must be halted via **clear isdn-testcall *grp/member*** prior to replacing the circuit pack. Ignore the packet-bus error indication, since the Maintenance/Test circuit pack has been determined to be defective.

d Error Type 513 indicates a failure of the Packet Bus Port Health Inquiry test. Either the packet-bus port has reported a self-test failure, or Communication Manager can communicate with the Maintenance/Test circuit pack but not with the Maintenance/Test circuit pack packet-bus port. Refer to the description of the Packet Bus Port Health Inquiry test, and follow the instructions indicated for the failure code that matches the `Aux Data` field.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table when inspecting errors in the system.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Bus Port Health Inquiry test (#567)	X	X	ND
Clear Error Counters (#270)		X	ND

1 D = Destructive, ND = Nondestructive

Clear Error Counters (#270)

This test is not an actual test in the strict sense of the word. Many circuit packs have counters in the Angel firmware. The circuit pack's Angel continuously runs port self-tests on idle ports and keeps track of any errors it detects by incrementing a firmware counter. When the counter value reaches some preset threshold, the Angel sends a single CCMS (Control Channel Message Set) error message uplink to Communication Manager. No more error messages of that type are sent uplink until the Communication Manager sends a downlink message to clear the counter. This strategy keeps a failed port/circuit pack from flooding Communication Manager with a continuous string of identical error messages. This test is used to clear the counter, so that if the port continues to fail during or after Communication Manager demanded testing, the Angel will send a message to indicate that fact.

This test is only used to send a downlink message to the Angel on the Maintenance/Test circuit pack. Since the Angel normally provides no uplink response to this message, this test should never abort or fail.

Table 607: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
Any	ABORT	This test should never abort.

1 of 2

Table 607: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
Any	FAIL	This test should never fail. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, escalate the problem.
	PASS	The message to clear the Maintenance/Test circuit pack's counter for Background Maintenance Failures has been sent.

2 of 2

Packet Bus Port Health Inquiry Test (#567)

This test verifies that the packet-bus fault-detection and maintenance function of the M/T-PKT is functioning properly. This is done by having the M/T-PKT perform a self-test. If the self-test passes, then the Packet Bus Port Health Inquiry test passes. If the self-test fails or Communication Manager cannot communicate with the M/T-PKT, then the test fails

Table 608: Test #567 Consistency Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources necessary to run this test are not available.
2500	ABORT	An internal operation failed, and the test could not be completed. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2059	FAIL	The M/T-PKT has reported a failure of the on-board self-test.
2060	FAIL	The M/T-PKT has reported an invalid state for the packet bus.
2061	FAIL	Communication Manager cannot communicate with the M/T-PKT, but can communicate with the Maintenance/Test circuit pack. **1** Retry the command. **2** If the test continues to fail, replace the Maintenance/Test circuit pack, and retry the command. **3** If the test continues to fail, see PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 to determine whether the M/T-PKT failure is being caused by a packet-bus fault.
	PASS	The M/T-PKT packet-bus fault-detection capability is operating correctly.

NO-LIC (No License)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
NO-LIC	MAJOR	None	NO License

NOTE:
The NO-LIC MO (No License) is a non-traditional MO. As a result, there are no associated tests or commands that are executed in the traditional manner.

The NO-LIC MO works with the LIC-ERR MO to find any errors/violations associated with the license file. Once a license file error occurs, MO LIC-ERR logs the error, raises an alarm, and starts a timer that is associated with the error. When the timer's limit is exceeded, MO NO-LIC causes the system to enter No-License mode.

The license file feature is loaded onto a switch during initialization of the switch software, restore of translations, and periodically. After initialization, a query is made to a software module called the license server. This module reads the license file, compares a serial number in the license file to a serial number in hardware, and compares the software version in the license with the running software version. If a match occurs, the license server delivers a new feature mask that controls revenue associated options.

For more information, see Installing License and Authentication files in Maintenance Procedures (555-245-103).

Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)			MAJOR	OFF	See Footnote[1]
513 (b)		None	MAJOR	OFF	See Footnote[1]
769 (c)		None	MAJOR	OFF	See Footnote[1]
1281 (d)		None	MAJOR	OFF	See Footnote[1]
1537 (e)		None	MAJOR	OFF	See Footnote[1]
1793 (f)		None	MAJOR	OFF	See Footnote[1]
2305 (g)		None	MAJOR	OFF	See Footnote[1]
2561 (h)		None	MAJOR	OFF	See Footnote[1]

1 These error types can be cleared by providing the correct license file per local instructions.

Notes:

a Error Type 1 — **S8700** / **S8500**: indicates that there is a serial-number mismatch of the reference IPSI and a subsequent License Error failure. **S8300**: indicates that there is a serial-number mismatch of the G700 motherboard on which the serial number resides and a subsequent License

Error failure. **S8100**: indicates that there is a serial-number mismatch of the TN2314 circuit pack on which the serial number resides and a subsequent License Error failure. This error is caused by the:

- **S8700** / **S8500**: Reference IPSI not responding
  S8300: G700 motherboard not responding
  S8100: TN2314 circuit pack not responding
- Expiration of the 10-day timer

The system enters No-License mode.

b Error Type 513 — the license has expired and:

- A License Error failure has occurred
- The 10-day timer has expired

The system enters No-License mode.

c Error Type 769 — the system is in the Feature Usage Exceeds Limits mode, and a License Error failure has occurred. System feature use has exceeded limits, and the 10-day timer has expired. The system enters No-License mode.

d Error Type 1281 — a new license was not installed after an upgrade. The 10-day timer has expired, and a License Error failure has occurred. The system enters No-License mode.

e Error Type 1537 — the license file is missing or corrupted. The system enters No-License mode.

f Error Type 1793 — a Software Version Mismatch has occurred. The system enters No-License mode.

g Error Type 2305 — the Offer Category of the License does not match the Offer Category in translations. The system enters No-License mode.

h Error Type 2561 — during the last attempted license-file audit, the license server did not respond in time.

On-Demand Tests for System Technicians

This MO provides no on-demand tests for system technicians.

NR-CONN (Network-Region Connect)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
NR-CONN	WARNING	**test failed-ip-network-region**	Network-Region Connect
NR-CONN	MINOR	**test failed-ip-network-region**	Network-Region Connect

A network region is a logical grouping of IP endpoints (including IP stations, IP trunks, and media gateways) sharing the same:

- Characteristics
- VoIP and signaling resources, such as a Media Processor board or a C-LAN

The Network-Region Connect (NR-CONN) MO monitors VoIP connectivity between network regions and initiates a:

- Warning alarm for a single failure

  This alarm is in response to one failed background ping test between IP endpoints in separate network regions. This test is part of the background Network Region Interconnectivity Test (#1417) on page 1358.

- Minor alarm for multiple failures

  Once a single failure is detected, Test #1417 is re-executed between different IP endpoints in the same pair of network regions. If the test still fails between these network regions:

  1. Maintenance software marks the connectivity between them as "failed"
  2. Communication Manager denies every attempted call between them

Use display failed-ip-network-region to display pairs of network regions with failed connectivity. In descending order of severity, this command lists up to 100 network regions with the most severely broken connectivity.

Use status ip-network-region to see the status of connections from a particular network region.

As a background operation during each 2-minute interval, Test #1417 checks the translated connections between 50 pairs of network regions until every translated connection has been tested, and then repeats. (The Communication Manager translation table's maximum capacity for network-region connections is 31,250. Testing every possible connection would require 625 2-minute test intervals during about 21 hours.)

As an on-demand operation, test failed-ip-network-region retests every network-region connection marked as "failed". Those connections that:

- Pass – Are returned to service
- Fail – Are remarked as "failed" and remain on the list of bad connections

Error Log Entries and Test to Clear Values

Table 609: NR-CONN Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)	0	Network Region Interconnectivity test (#1417)	MINOR	ON	

Note:

a **Error Type 1:** One or more network-region connections have failed.

1. Enter display failed-ip-network-region to verify that connections between pairs of network regions are failing.
2. If so, enter test failed-ip-network-region to retest these paths.
3. For each affected network region, check the error log for failures to related MOs, such as:
   - IPMEDPRO (IP Media Processor Circuit Pack)
   - MEDPRO (Media Processor MAPD Circuit Pack)
   - CLAN-BD (Control LAN Circuit Pack)
   - DIG-IP-S (Digital IP Station)
   - RDIG-STA (Remote Digital Station)

   and resolve any problems.
4. Enter **test failed-ip-network-region** to retest these paths.
5. If errors persist, escalate.

Technician-Demanded Test: Description and Error Code

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Network Region Connectivity test (#1417)		X	ND

1 D = Destructive; ND = Nondestructive

Network Region Interconnectivity Test (#1417)

This test is **non**destructive.

Test #1417 is a nonstandard test, since it does not specify and list error codes in the usual manner. If this background test detects a failure, the test is retried using different IP endpoints (if available) from the same two network regions. If the test still fails between these network regions:

1. Maintenance software marks the connectivity between them as “failed”
2. Communication Manager denies every attempted call between them

For this test, devices that can serve as IP endpoints include:

- IPMEDPRO
- MEDPRO
- CLAN-BD
- IP phones or Softphones, with the ability to initiate a ping

For a network region without an IPMEDPRO, MEDPRO, or a CLAN-BD, Test #1417 looks for another ping-capable endpoint. If found, the region's testing continues. If not, the test assumes that the region's connectivity is okay.

Table 610: Test #1417 Network Region Interconnectivity Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Internal error
2		**1** Retry the command at 1-minute intervals up to 3 times.
11		**2** If the problem persists, escalate the problem.
1005	ABORT	Incorrect test configuration. **1** Verify Ethernet link is in service on all CLAN boards in source and destination with **status port *UUCSSpp*** or **status link *n***).
1125	ABORT	Ethernet link not in service. **1** Verify Ethernet link is in service for all CLAN boards in the source and destination regions under test using **status port *UUCSSpp*** or **status link *n***. If interface is enabled, the ethernet link is expected to be inservice for this test to run.
2000	ABORT	Did not receive a response from a circuit pack being used for the test within the allowable time period. **1** Reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). **2** If the test fails again, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Escalate if the problem persists.
2801	ABORT	No IP address defined. Verify IP interfaces translations and retest.
2802	ABORT	Different IP address pinged than software had allocated for the test. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 610: Test #1417 Network Region Interconnectivity Test

Error Code	Test Result	Description / Recommendation
2807	ABORT	The board is administered but not enabled in the **change ipserver-interfaces** screen.
1003	FAIL	Ping to the destination failed due to on-board problems of the source of the ping. The source of the ping can be a CLAN board or a IPMEDPRO board for this error to occur. **1** Retry the command at 1-minute intervals, up to 3 times. **2** Look for problems associated with IPMEDPRO or CLAN boards in this region.
7, 89, 1007	FAIL	Ping to the destination failed due to the destination down. **1** Verify that at least one destination reachable through the network regions being tested is up. Ping this destination (**ping ip-address *xxx.xxx.xxx.xxx***).
2805	FAIL	The number of pings received did not match the number sent (normally one ping is sent). This means that no ping responses were received from the destination region endpoint being tested back to the source endpoint sending the ping.
	PASS	TCP/IP Ping test between network regions is successful.

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OPS-LINE (DS1 Off-Premises Station Line)

S8700 / S8500 / S8100

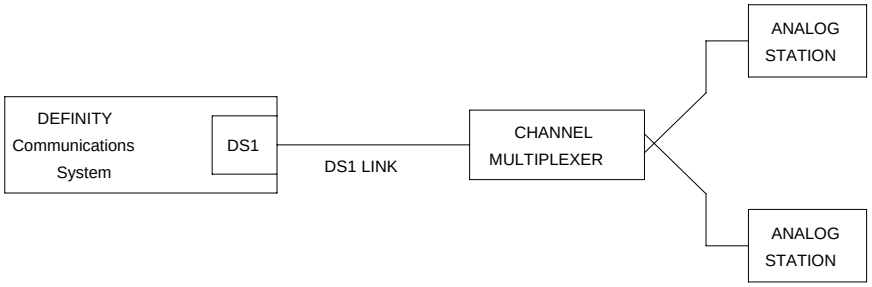
MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
OPS-LINE	MINOR	**test station *extension* l**	DS1 OPS Line
OPS-LINE	WARNING	**test station *extension***	DS1 OPS Line

An analog Off-Premises Station (OPS) can be connected to the system through a DS1 link. A TN767 DS1 Interface circuit pack or a TN464 UDS1 Interface circuit pack can support up to 24 DS1 OPSs. Since the DS1 OPS is an analog telephone set, a channel multiplexer is necessary as the remote DS1 endpoint that converts the digital signal of a DS1 port to the OPS Line and vice versa.

The DS1 OPS Line Maintenance provides a strategy to maintain an OPS Line via a trunk port of the TN767 DS1 Interface circuit pack or the TN464 UDS1 Interface circuit pack. (Throughout this section, the term DS1 Interface can apply to either of these circuit packs.) The strategy covers initialization tests, periodic tests, scheduled tests, system technician-demanded tests, and alarm resolution and escalation. Two service states are specified in a DS1 OPS Line maintenance. They are: *out-of-service*, in which the line is in a deactivated state and cannot be used for either incoming or outgoing calls; or *in-service*, in which the line is in an activated state and can be used for both incoming and outgoing calls. If the DS1 Interface circuit pack is out-of-service, then every line on the DS1 Interface circuit pack is put into the out-of-service state, and a Warning alarm is raised.

For maintenance of the remote DS1 endpoint (for example, a Channel Division Multiplexer or D4 Channel Bank), refer to the vendor's maintenance documentation for details.

Figure 104: DS1 OPS Line Interactions



Error Log Entries and Test to Clear Values

Table 611: DS1 OPS Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test station** *ext*
15 (a)	Any	Audit and Update test (#36)			
18 (b)	0	**busyout station** *ext*	WARNING	OFF	**release station** *ext*
130 (c)		None	WARNING	ON	**test station** *ext*
1281		Conference Circuit test (#7)	MINOR	ON	**test station** *ext* **l r 4**
1537		NPE Crosstalk test (#6)	MINOR	ON	**test station** *ext* **l r 3**
1793 (d)					**test board** *UUCSS* **l**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a This is a software audit error that does not indicate a hardware malfunction. Run the short test sequence, and investigate associated errors (if any).

b Error 18 indicates that the DS1 OPS Line was busied out by **busyout station *ext***. No calls can be made on this line.

c Error 130 indicates that the circuit pack was removed or was insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d Error 1793 indicates a problem with the DS1 Interface circuit pack. Because there is no error against the OPS-LINE port, no alarm is raised against the OPS-LINE port. However, there should be errors logged against the DS1 Interface circuit pack. Look for DS1-BD/UDS1-BD errors in the Hardware Error Log, and follow the procedures in DS1-BD (DS1 Interface Circuit Pack) on page 760.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the NPE Crosstalk test (#6), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	ND
Conference Circuit test (#7) **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	ND
DS1 OPS Switchhook Inquiry test (#312)	X	X	ND
Audit and Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM-bus interface. (The TN464 UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips.) The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and takes about 20 to 30 seconds to complete.

Table 612: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate system resources to run this test or an internal system error (software) occurred. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status station** or **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Use **status health** to determine if the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.

Table 612: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. Use **list measurements tone-receiver** to display information about the system's tone receivers. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The test was aborted because the port was seized by a user for a valid call. Use **status station** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to an already existing error on the specific port or due to a more general error on the circuit pack. **1** Examine the error log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error. (Error code 1793 indicates a problem with the DS1 interface board, and any problems on the associated DS1-BD or UDS1-BD should be resolved first.)
G700: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The test failed. This can be due to on-board or off-board problems. Off-board problems of concern include EXP-PN, EXP-INTF, or RMC-ENV faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear every off-board problem before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. **1** Resolve any TONE-BD and/or TONE-PT errors. **2** Retest when the faults from step 1 are cleared.

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Table 612: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If not, ensure that there is a valid board inserted.

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Conference Circuit Test (#7)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM-bus interface. (The TN464 UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips). The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 613: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status station** or **status trunk** to determine when the port is available for testing.
1002	ABORT	The test was aborted because the system could not allocate time slots for the test. The system might be under heavy traffic conditions, or it might have time slots out of service due to TDM-BUS errors. Use **status health** to determine if the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors, is not handling heavy traffic, and the port status is idle, retry the command at 1-minute intervals up to 5 times.

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Table 613: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue **list measurements tone-receiver** to display basic information about the system's tone receivers. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** or **status trunk** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1018	ABORT	The test was disabled by translation. **1** You may want to determine why the test has been disabled before you enable it. **2** To enable the test for the particular analog station being tested, enter **change station *extension***, and set the `Test` field on the Station screen to **y**.
1020	ABORT	The test did not run due to an already existing error on the specific port or due to a more general error on the circuit pack. **1** Examine the error log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error. (Error code 1793 indicates a problem with the DS1 interface board, and any problems on the associated DS1-BD or UDS1-BD should be resolved first.)
G700: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	The test was aborted because response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 613: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
Any **S8100**: (blank)	FAIL	The NPE of the tested port did not conference the tones correctly. This can cause noisy and unreliable connections. **1** Enter **list configuration board *UUCSS***. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. The error log may have error type 1281 entries. **2** Test every administered trunk on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. **3** If every port fails, check the CARR-POW (see note below). **4** If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. **5** If the retry passes and troubles have been reported, coordinate isolation with the far-end PBX. Make sure that the near- and far-end switches and any NTCE equipment (the CSUs) have the correct administration. **6** Replace the circuit pack. **7** If the conference circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. **S8700 MC**: If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. See CARR-POW (Carrier Power Supply) on page 578 to investigate problems with either a 631DB AC or a 645B DC power unit. **S8700 IP**: If a TN736 or TN752 power unit circuit pack is present, the power unit may be defective. See RMC-ENV (Power/Fan Sensors) on page 1593 to investigate problems with a power unit. If a red LED is lit on TN736 or TN752 power unit circuit pack, replace the pack.

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Table 613: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack to assure that the trunk's translation is correct. Translation updates include the following data: line type, dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of the trunk as kept in the DS1 Interface circuit pack and in the switch software.

Table 614: Test #36 Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	The test was aborted because system resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension of the port. Use **status station** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. **2** If the port is idle, retry the command at 1-minute intervals up to 5 times.

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Table 614: Test #36 Audit and Update Test

Error Code	Test Result	Description / Recommendation
1006	ABORT	The test was aborted because the station is out of service. This condition may be accompanied by an error type 18 entry in the error log. You may want to determine why the station was taken out of service. (When stations are taken out of service by maintenance software, the problems that preceded that point must be cleared.) **1** Use **status station** to check the service state of the port. If the port is indeed out of service, enter **release station** to bring the station back into service. **2** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** **S8100**: Retry the command at 1-minute intervals for a maximum of 5 times. **2** **S8100**: If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
7 or 8	FAIL	Test failed due to internal system error. Do not replace port board. • Error code 7: the failure occurred during station translation download (to DS1 Interface circuit pack). • Error code 8: the failure occurred during station ringer update. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 614: Test #36 Audit and Update Test

Error Code	Test Result	Description / Recommendation
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack and switch software are consistent. If the trunk is busied out, the test will not run but will return PASS. To verify that the station is in-service: **1** Enter **status station** to verify that the station is in-service. If the station is in-service, no further action is necessary. If the station is out-of-service, continue to step 2. **2** Enter **release station** to put the station back into in-service. **3** Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config** and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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DS1 OPS Switchhook Inquiry Test (#312)

This test initiates the Switchhook Audit test. The test queries the switchhook state of the Off-Premises-Station in switch software. If the state in switch software disagrees with the state on the DS1 Interface circuit pack, then the state in the switch software is updated to match the state on the DS1 Interface circuit pack.

Table 615: Test #312 DS1 OPS Switchhook Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 615: Test #312 DS1 OPS Switchhook Inquiry Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	Test failed due to incompatible configuration administered in station administration. **1** Use **display station** to verify that the station is not the 24th port of the DS1 Interface circuit pack while common channel signaling is specified. Use **display ds1** to check the signaling type of the DS1 circuit pack.
1006	ABORT	The test was aborted because the station is out of service. This condition may be accompanied by an error type 18 entry in the error log. You may want to determine why the station was taken out of service. (When stations are taken out of service by maintenance software, the problems that led up to that must be cleared.) **1** Use **status station** to check the state of the port. If the port is indeed out of service, enter **release station** to bring the station back into service. **2** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The DS1 Interface circuit pack is out-of-service. **1** Look for DS1-BD/UDS1-BD errors in Hardware Error Log. If present, see DS1-BD (DS1 Interface Circuit Pack) on page 760. **2** Retry the command.
2000	ABORT	The test was aborted because response to the test was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test aborts with error code 2000 again, run short test sequence on the associated DS1-BD or UDS1-BD. If tests 138 through 145 on the associated DS1-BD or UDS1-BD are also aborting with error code 2000, hyperactivity on the board or facility is indicated. In this case, the hyperactivity problem should be dealt with first.
2012	ABORT	The test was aborted due to a system error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	Internal system error. **1** Look for DS1-BD/UDS1-BD errors in the Hardware Error Log. If present, see DS1-BD (DS1 Interface Circuit Pack) on page 760. **2** If a channel multiplexer is used as the remote DS1 endpoint to which the station connects, refer to the multiplexer vendor's maintenance document for diagnosis. **3** Retry the command at 1-minute intervals up to 5 times.

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Table 615: Test #312 DS1 OPS Switchhook Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	The station hook states in both switch software and DS1 Interface circuit pack are consistent.
0 2012	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be inserted correctly, issue **busyout board**. **3** Issue the **reset board** command. **4** Issue the **release board** command. **5** Issue **test board long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, dispatch to check to ensure that there is a valid board inserted.

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PDMODULE (Processor Data Module) TDMODULE (Trunk Data Module)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
PDMODULE[2]	MINOR	**test port *location* long**	Processor Data Module
PDMODULE	WARNING	**test port *location* short**	Processor Data Module
TDMODULE [2]	MINOR	**test port *location* long**	Trunk Data Module
TDMODULE	WARNING	**test port *location* short**	Trunk Data Module

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 Digital Terminal Data Modules (DTDM), and Data Adaptors (DA) in linked mode are considered part of the Digital Line MO. See the DIG-LINE section for maintenance of these devices. DAs in stand-alone mode are included in PDMODULE.

Some of the alarms that are logged due to PDMODULE and TDMODULE test failures may be related to circuit-pack problems reported during DIG-BD testing. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

The PDMODULE and TDMODULE MOs monitor and test Digital Line circuit pack ports that are connected to Data Communications Equipment (DCE) or Data Terminal Equipment (DTE). DCE include processor data modules (MPDM) and Data Adaptors (DA). DTE include trunk data modules (DTE). These stand-alone data modules provide interfaces between DCP ports on the Digital Line circuit packs and data equipment such as terminals, host computers, and data modems. (See the following list and figure.) Data modules are used for dial-up and permanent circuit-switched data calls.

Digital Line circuit packs also connect to digital terminal data modules (DTDMs), which work in conjunction with a voice terminal. Those configurations are covered by the DIG-LINE MO. Circuit pack-level maintenance is covered by DIG-BD whose strategy is described in the XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

Digital line circuit packs include the TN754, (**S8100**: TN754 [G3iV2-386]), TN754B, (**S8100**: TN784), TN413, (**S8100**: TN413 [G3iV2-386]), TN2136 (**S8100**: TN2136 [G3iV2-386]). See DIG-LINE for more information about the characteristics of these circuit packs.

NOTE:
S8300 / **G700**: Although the PDMODULE/TDMODULE MO is provided for a G700 media gateway, this MO only partially supports the G700's MM712 DCP media module.

Stand-Alone DCP Data Modules

There are two types of stand-alone DCP data modules:

Table 616: Stand-Alone DCP Data Modules

Type	Name[1]	Interfaces to:
MPDM	Modular Processor Data Module	DTE (data terminals, host computers, printers, etc.)
MTDM	Modular Trunk Data Module	DCE (modems, data modules, etc.)

1 Early versions of these data modules were referred to as PDMs and TDMs, respectively. Later models are designed to provide a variety of interfaces by using interchangeable modules and are thus called modular data modules. Both types are supported by the tests described in this section

Data Adapters

TN2136 circuit packs use IDCP signaling and a DAA2 Data Adaptor (DA) to interface to DTE. DAs can operate in either of two modes which are covered by different MOs:

Table 617: Data Adaptor Modes

DA Mode	Administered as:	Endpoint	Maintenance Object
Stand-Alone	PDM	data endpoint only	PDMODULE
Linked	DTDM	IDT1/2[1] and optional data terminal	DIG-LINE

1 IDT1/2: Italtel Digital Telephone, Model 1 or 2 (also known as Digital Telephones TD7210 and TD7206).

Configurations and Maintenance

S8100

The MPDM provides an interface for Data Terminal Equipment (terminals), and the MTDM (see Note) provides an interface for Data Communications Equipment (transmission equipment such as modems).

NOTE:
Early versions of these data modules were referred to as PDMs and TDMs, respectively. Later models are designed to provide various customer interfaces through the use of interchangeable interface modules and, therefore, are called modular data modules. Both versions are supported by the tests described in this section.

In the following discussion, the general term data module refers to MPDMs, MTDMs, and DAs. The PBX loop or digital link between a data module and the Digital Line port supports two logical information channels and one signaling channel. Data modules generally use the primary information channel for data communications and the signaling channel for dialing and call supervision. With 4-wire DCP, the secondary information channel can be used to support a second data module on a shared port.

Besides being used for data calls between terminals, computers, and data communications equipment, data modules also serve as interfaces to equipment associated with system features such as System Administration, Station Message Detailed Recording, Message Center Service, Automatic Call Distribution, Distributed Communications System, and Audio Information Exchange. Maintenance for data modules associated with these latter services are covered by other MOs such as PMS-PRNT, JNL-PRNT, and PMS-LINK.

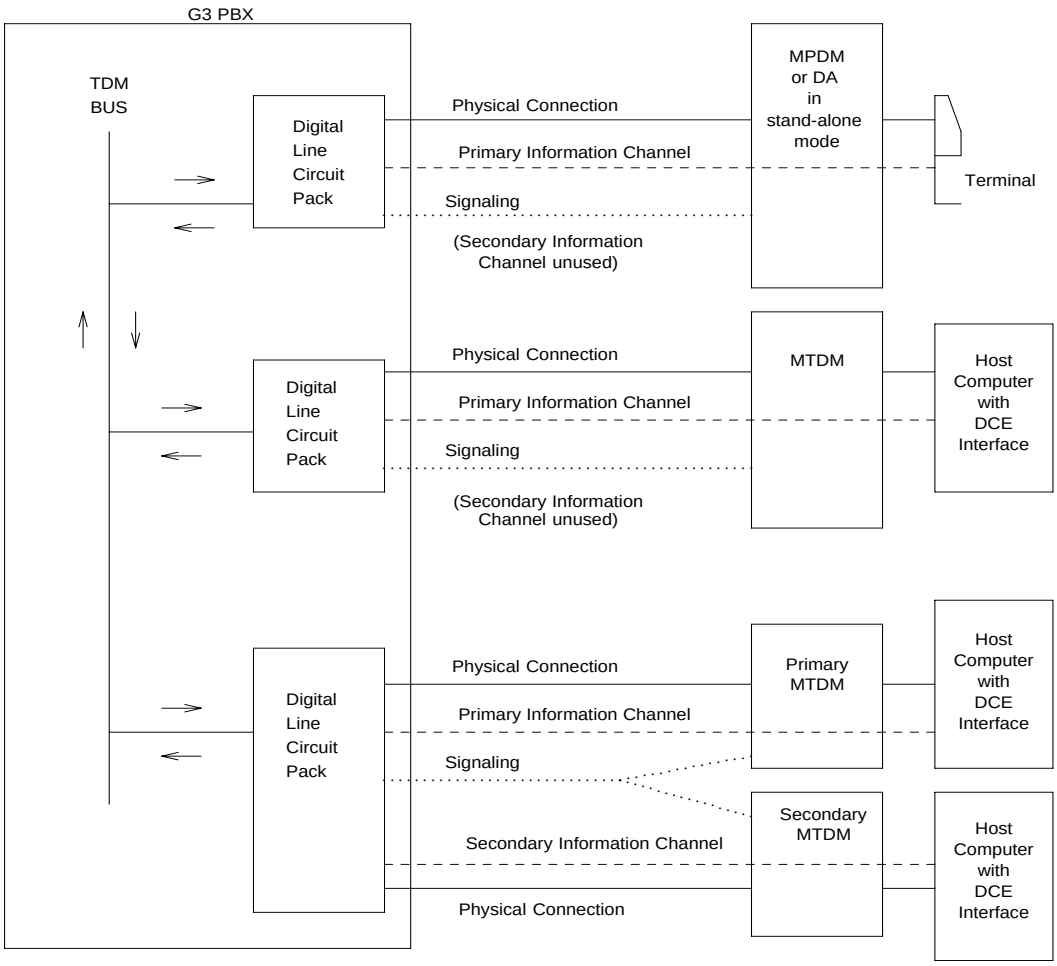
Maintenance of data modules is closely related to and interacts with Digital Line circuit pack maintenance, and test results for data modules can be affected by the health of the Digital Line circuit pack. Keep this interaction in mind when investigating customer-reported problems with data modules.

Data modules provide a variety of option switches to allow the customer to select data rates, parity, keyboard dialing, local, and remote loop back, etc. (The DAA2 Data Adaptor has an AT (Hayes) type interface that allows selection of the above parameters as well as mode — linked or stand-alone.) An incorrect selection will not necessarily cause errors, alarms or test failures, but it can result in service disruption. See the installation manual provided with the data module for more information about those options.

This discussion occasionally refers to a station's service state, which is defined as follows:

Out-of-Service	The port, and thus the data module, have been removed from service. Causes for this include busyout of the port, removal of the Digital Line circuit pack and failure of the NPE Crosstalk test (#9).
Disconnected	The port is administered but the associated digital link does not respond. An administered port is put in a disconnected state after a system reboot or circuit pack insertion. This state persists until a link-reset-pass message is received from firmware on the circuit pack.
In-Service	When switch software receives a link-reset-pass message from the port, the port is placed in service. If the link-reset-pass message is missed, and an off-hook message is received while the port is in the disconnected state, maintenance software will run an ID request test and put the port into service upon receiving a correct response.

Figure 105: Typical Data Module Configurations



Error Log Entries and Test to Clear Values

Table 618: PDMODULE, TDMODULE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0 (a)	0	None			
1 (b,n)	40987	None	WARNING	OFF	
1 (c,n)	1 – 20	None	WARNING	OFF	
15 (d)	Any	None			
18 (e)	0	**busyout port *UUCSSpp***	WARNING	OFF	**release port *UUCSSpp***
257 (f)	40971	None			
513	0	Data Module audits (#17)	WARNING	OFF	**test port *UUCSSpp* sh r 6**
769 (g,n)	40988	None	WARNING	OFF	

Table 618: PDMODULE, TDMODULE Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1281	Any	Data Module audits (#17)	WARNING	OFF	**test port *UUCSSpp* sh r 4**
1537 (h,n)	40968	None	WARNING	OFF	
1793		Information Channel and Control Channel Looparound (#13)	MINOR	ON	**test port *UUCSSpp* l r 3**
2049		NPE Crosstalk (#9)	MINOR	ON	**test port *UUCSSpp* l r 3**
2304 (i)		None			
2305 (j)	32770	None			
2305 (k)	40967	None			
2561 (l)	Any	Data Module Internal Looparound (#175)	WARNING	OFF	**test port *UUCSSpp* l r 5**
2817 (m)		Link GPP Loop (#183) Against Links	MAJOR	ON	
3841 (n)		None			

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Error Notes:

a Error type 0 appears in the Error Log only if a Digital Line circuit pack that has ports administered has been removed since the Error Log was last cleared. Make sure that the circuit pack has been re-inserted.

b Error type 1 with aux data 40987 indicates an off-board problem detected by the port circuit, and may result in a noisy port or link. See note *n* for recommendations.

> **NOTE:**
> **S8100**: Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring, 555-204-111*.

c Error type 1 with aux data of 1 to 20 is logged when at least 15 off-board problems have been detected with the link to the data module. Each error detected increments an on-board counter. The aux data gives the value of this counter divided by 15. The user could experience a noisy port or link. See note “n” for recommendations.

> **NOTE:**
> **S8100**: Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring, 555-204-111*.

d Error type 15 is an internal that occurs when an audit request fails.

e Error type 18 is logged when the port in question is demand busied out Make sure that the port is released from busyout.

f Error type 257 indicates problems with transmitting to the data module. This is usually an on-board problem and can be ignored if no user complaints are received. Otherwise, check for faulty wiring.

g Error type 769 indicates that EPF has been turned off due to the overcurrent condition at the data module. See the recommendations in note *n*. This may also be caused by the PTC being in the "tripped" position due to a short on the power line. You can correct this by removing the short, unplugging the data module from the wall for about 30 seconds, and plugging it back in.

NOTE:
S8100: Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring, 555-204-111*.

h Error type 1537 indicates that an in-line maintenance error has generated an off-board warning due to some problem with the link to the data module. This can be ignored if no user complaints are received. Otherwise, see note *n* for recommendations.

NOTE:
S8100: Refer to the *DEFINITY® Communications System Generic 1 and Generic 3i Wiring, 555-204-111*.

i Error type 2304 indicates an internal error. No action is necessary.

j Error type 2305 with aux data 32770 indicates that the data equipment went off-hook while the associated link was being initialized (in a disconnected state). Use **status data-module** to determine the state of the data module. The off-hook should have changed the service state to in-service. No action is necessary.

k Error type 2305 with aux data 40967 indicates that the link between the circuit pack and the data module has been reset successfully. The link is normally reset when the circuit pack associated with an administered port is first plugged in (assuming that the data module is already in place and connected to the associated port), when a port is first administered (assuming the associated circuit pack is plugged in and that the data module is connected to the associated port), or when a data module is first connected to an administered port. No system technician action is necessary.

l Error type 2561 indicates that the downlink buffer on the circuit pack has overflowed. No action is necessary.

m Error type 2817 indicates that a DCP endpoint may have been disconnected.

n Make sure the data module is connected and operating properly. Check for faulty wiring. If necessary, reduce the length of the cable between the data module and the switch to 5000 ft. for 24-gauge wire or 4000 ft. for 24-gauge (**S8100**: 26-guage) wire.

If the problem still exists, replace the circuit pack. Once the problem has been resolved, the alarm will be retired in 60 minutes (90 min. for error 1537). (These error counters use the leaky bucket mechanism.)

The DA module is not phantom-powered from the port. Thus when it is in linked mode, its range is limited by the Italtel digital phone's limit: 0.7 km (2300 ft.) on 26-gauge wire or 1.8 km (5900 ft.) on 22-gauge (0.6 mm) wire. If in stand-alone mode, it is limited by the maximum length of loop allowed from the Digital Line Interface (DLI) component: up to 3.5 km (2 miles) on 22-gauge (0.6 mm) wire.

S8100: This endpoint is part of processor link. Link initialization has failed (or demand test for #183 for PI links has failed) and is indicating the associated PDM as the cause. Check the PDM, the wiring to the PDM and the link to the far end (i.e. AUDIX DCS, etc.) to resolve the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. For example, by clearing error codes associated with the Data Module Internal Loop-around test (#175), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Data Module Internal Loop-around test (#175) **G700**: This test aborts with Error Code 1412 on a G700 media gateway.		X	ND
Digital Port Board Network Processing Element Crosstalk test (#9)		X	ND
Port Circuit Information Channel and Control Channel Loop-Around test (#13) **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	ND
Data Module Audits test (#17)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#9)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. If a secondary data module is assigned, it is tested after the primary data module. If either test fails, both data modules are taken out of service. This test usually run only during the long test sequence and takes about 20 to 30 seconds to complete.

Table 619: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
S8100: 1	ABORT	During testing of the primary information channel, system resources may not have been available. **1** Check the port status. Use the **display port PCSSpp** command to determine the station extension of the port. Use the **status station** command to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for this test. You must wait until the port is idle. **2** If the port status is idle, then retry the command at one-minute intervals a maximum of 5 times.

Table 619: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the extension of the data module port. Use **status data-module** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the extension of the data module port. Use **status data-module** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	Test disabled by background testing. Use **status data-module** to determine when the data module is available for testing.
G700: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2020	ABORT	The test did not run due to a previously existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the previously existing error.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

2 of 3

Table 619: Test #9 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The NPE of the tested port was found to be transmitting in Error Log. This will cause noisy and unreliable connections. Failure code 1 indicates that the Crosstalk test failed on the primary channel. Failure code 2 indicates that the Crosstalk test failed on the secondary channel. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** To be sure that this is not an intermittent problem, repeat this test up to up to 10 times and verify that it continues to pass. **2** If complaints still exist, examine the data module, connections, and wiring.

3 of 3

Information and Control Channel Local Loop Test (#13)

This is a set of four tests that check the operation of the information and control channels used between Communication Manager and the Digital Line port circuit. This is an Internal Loop around test only and does not check building wiring. See Test #175 for external loop around tests to the data module.

1 Communication Manager first sends a message to the on-board microprocessor to loop around both the information and control channels for the port. Then, the primary information channel loop back test is run. The test is performed by sending a digital count from the Tone-Clock circuit pack on the primary channel time slot and receiving the same digital count with a General-Purpose Tone Detector. The digital count looks like transparent data to the on-board microprocessor.

2 With the port still in loop-around mode, the S Channel Loop-around test is performed next. This test consists of sending four different transparent patterns to the on-board microprocessor, receiving them back, and comparing them.

3 The third test is a loop around test for the secondary information channel. It is performed only if a secondary data module is assigned to the port.

4 The fourth test is a Conference test of the primary channel. This is the same test as Analog Line Conference test (#6).

Only one result is reported for the three tests run. If any test fails or aborts, the sequence is stopped.

Table 620: Test #13 Information and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the data module extension. Use **status data module** with the extension number to determine the service state of the data module. If the service state indicates that the data module is in use, then the port is unavailable for certain tests. You must wait until the port is idle before retesting. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port *UUCSSpp*** to determine the data module extension. Use **status data module** with the extension number to determine the service state of the data module. If the data module is in use, wait until the port is idle before retesting.
G700: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
S8100: 2001	ABORT	System resources required to run this test are not available. **1** Retry the test at one-minute intervals a maximum of 5 times.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 620: Test #13 Information and Control Channel Local Loop Test

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
7	FAIL	Conference test failed on the primary information channel. In some cases, user may not notice disruption in service. In extreme cases, conferencing feature may not work at all.
14	FAIL	The primary information channel is not transmitting properly. User impact may range from noticing nothing to not being able to use this port.
15	FAIL	The control channel between the processor and Digital Line circuit pack is not transmitting properly. This can cause a wide range of effects. The user may notice nothing or the port may be totally unusable. This could also disrupt other users. **1** Run circuit pack tests to check the Tone Generator and the Tone Detector circuit packs using **test board *UUCSS* short**. **2** Resolve any problems that are detected on the Tone Generator circuit pack or Tone Detector circuit pack. **3** If the Tone Generator and Tone Detector circuit packs are functioning properly, and the test still fails, replace the Digital Line circuit pack.
16	FAIL	The secondary information is not transmitting properly. This can cause a wide range of effects. The user may notice nothing or the port may be totally unusable. **1** To be sure that this is not an intermittent problem, repeat this test up to up to 10 times to make sure it continues to pass. **2** If complaints still exist (poor data transmission), examine the data module, connections, and wiring.
	PASS	Information and Control Channel Local Loop test passed. Every channel is transmitting properly.

2 of 2

Data Module Audits Test (#17)

This is a series of six tests that are classified as hardware audits. The processor sends messages to the on-board microprocessor to perform the following tests:

- Switchhook Inquiry — This is an update of the processor's software records based on the on-hook/off-hook status of the data module.
- Bad Scan Inquiry — A message is sent uplink that contains a count generated by certain events relating to the digital loop's (link) conditions. This could be an indication of communication problems between the processor and digital port board.
- EPF inquiry — The status of the Electronic Power Feed is sent uplink. EPF is not used for data modules.
- ID Request — A request is made to the data module for its status. The data module sends its configuration information and health information back. This information is checked and a pass/fail result is provided.

- Ringer Update — This updates the data module's ringer state according to processor records.
- Translation Update — This is a message normally used with digital stations to refresh the default value that causes the station to send touch tones only in the primary information channel. This test is not used with data modules.

Table 621: Test #17 Data Module Audits Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Switchhook audit timed out. **1** Verify the data module is connected to the PBX and repeat the test. **2** If the test aborts, replace the data module and repeat the test. **3** If the test continues to abort, replace the circuit pack and repeat the test.
2	ABORT	ID request fails, health bit is defective, or no response from on-board microprocessor. **1** Verify that the correct data module type (PDM versus TDM) is administered. **2** If the test aborts, replace the data module and repeat the test. **3** If the test aborts, replace the circuit pack and repeat the test.
3	ABORT	No response from EPF audit.
4	ABORT	Internal system error **1** Resolve any outstanding circuit pack maintenance problems. **2** Retry the command at 1-minute intervals up to 5 times.
5	ABORT	Ringer update aborted (data module not in the in-service state) **1** Verify that the data module is powered (power LED on). **2** Make sure data module is connected to the building wiring, check for faulty wiring, check for faulty data module. **3** Retry the command at 1-minute intervals up to 5 times. **4** Replace the Data Module and repeat the test. **5** If the test continues to abort, replace the Digital Line circuit pack and repeat the test.
6	ABORT	Data module translation update aborted. **1** Verify the data module is connected to the PBX. **2** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 621: Test #17 Data Module Audits Test

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using **display port**, where the display shows that the port is a TTI port, or **list config**, where the display shows a `t` for the port. **2** If **list config** or **display port** indicate that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test was not received within the allowable time period.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Data Module audits passed. This digital port circuit pack is functioning properly. **1** If complaints still exist, investigate by using other port tests and by examining the data module options, wiring, and connections.

2 of 2

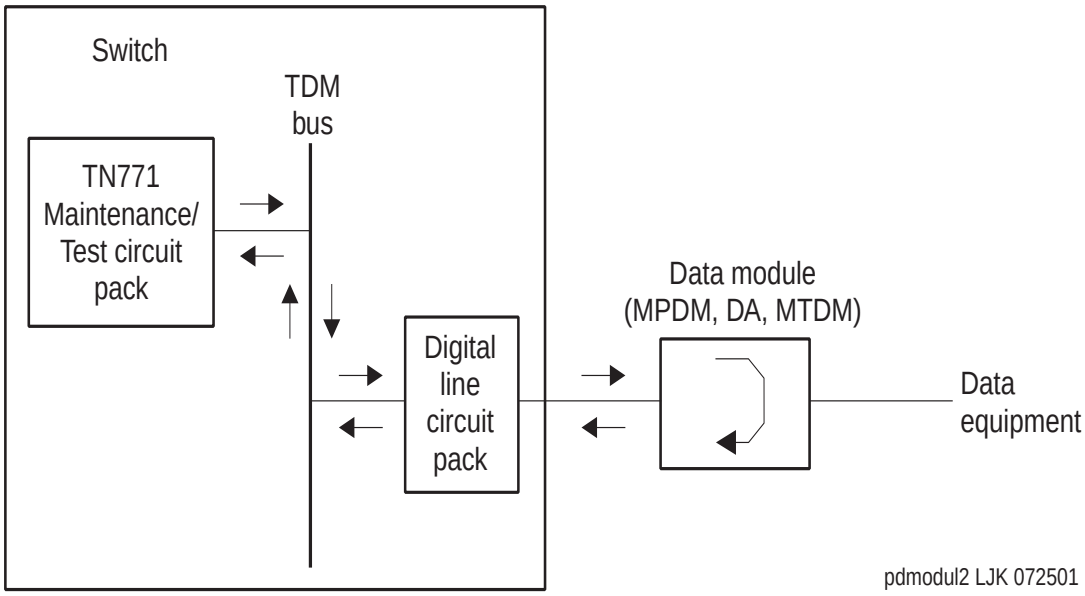
Data Module Internal Loop-Around Test (#175)

This test verifies that a data message can be sent from the PBX, through the building wiring, through an internal loop-around path in the data module, and back to the PBX. This path is illustrated below.

For this test to run, the `Remote Loop-Around Test` field on the Data Module administration screen must be set to **y**, indicating that the data module endpoint supports the test.

NOTE:
G700: This test aborts with Error Code 1412 on a G700 media gateway.

Figure 106: Internal Loop-Around Test



A signaling message is sent through the digital port circuit pack to the data module, requesting it to enter loop-around mode. A test pattern is then sent from the TN771D Maintenance/Test circuit pack, over the path illustrated above, and back to the TN771D where it is checked for consistency.

The test aborts if any of the following local PBX resources are not available: a digital port on the TN771D (there are two such digital ports, but only one may be used at a time), two TDM time slots and an idle digital port connected to the data module.

S8100: This test aborts if no terminal or communications equipment is connected to the data module. It also aborts if a number of local PBX resources are not available. These resources include a network control channel from the Network Control circuit pack (there are a maximum of four channels administered as Netcon-type data modules), two TDM time slots (one for each direction of the loop around message), and an idle digital port circuit associated with the data module under test. Failure to allocate any of these resources causes the test to abort with a specific error code for that resource.

Table 622: Test #175 Data Module Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
S8700 / S8500		
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status data-module** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Loop around testing is not enabled on the data module administration screen. **1** Set `Loop-Around Test` field to **y** on the data module administration screen.

Table 622: Test #175 Data Module Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
1042	ABORT	The port under test is a TTI port and thus has only default translations and no assigned extension. The test requires an extension assigned to the port being tested. **1** If there is a need to execute the test on this particular port, then you must fully administer the port so that is has an assigned extension.
1180	ABORT	A Maintenance/Test circuit pack digital port is not available to carry out the test. **1** Check to see if the Maintenance/Test digital ports are present. Use **list config board** and look for ports 02 and 03. **2** If the digital ports (02 and 03) on the M/T-BD are absent, see M/T-DIG (Maintenance/Test Digital Port) on page 1341. **3** If the digital ports are present, try the command again at 1-minute intervals up to 5 times.
1181	ABORT	No time-slots available to connect digital ports for the test. **1** Try the command again at 1-minute intervals up to 5 times.
1182	ABORT	Internal system error. Failed to connect the digital ports with time-slots. **1** Retry the command at 1-minute intervals up to 5 times.
1340	ABORT	No Maintenance/Test digital port is currently available to perform this test. **1** Use **list config** to determine whether any Maintenance/Test digital ports (ports 02 and 03 on the Maintenance/Test circuit pack) are present in the system. Because at least one Maintenance/Test circuit pack must always be present in the PN of S8700 IP Multi-Connect configurations, there should be at least two such ports present. If the ports are present, proceed to step 2. Otherwise, determine why no ports appear in the **list config** display. See M/T-DIG (Maintenance/Test Digital Port) on page 1341 and M/T-BD (Maintenance/Test Circuit Pack) on page 1338. **2** Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port) on page 1341. **3** If the ports are present and no errors are logged against them, retry the command at 1-minute intervals up to 5 times. **4** If the test continues to abort, replace the Maintenance/Test circuit pack.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using **display port** where the display shows that the port is a TTI port, or **list config**, where the display shows a “t” for the port. **2** If **list config** or **display port** indicate that the port is not a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.

Table 622: Test #175 Data Module Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
2005	ABORT	The handshake between the Maintenance/Test digital port and the Data Module failed. **1** Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port) on page 1341. **2** If test still aborts on retry, check physical connection of data module under test. Make sure the switches are on NORM, OFF (between REM_LP and LOC_LP), 9600, and ASYN. **3** If the test still aborts, replace the Data Module.
2312	ABORT	The loop-around test did not complete, failed to receive loop-back data. **1** Check for M/T-DIG error in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port) on page 1341. **2** Retry the test, if still aborts, replace the Data Module. **3** If the test aborts again, replace the Digital Line circuit pack.
2313	ABORT	The Maintenance/Test digital port allocated for this test did not respond to downlinked message. **1** Look for M/T-DIG errors in the Error Log. If present, see M/T-DIG (Maintenance/Test Digital Port) on page 1341. **2** Retry the command at 1-minute intervals up to 5 times. **3** If the test continues to abort, replace the MTB.
2314	ABORT	Data Module did not respond to downlinked message. **1** Check the wiring of the Data Module under test. **2** Verify that the Data Module is powered (power LED on). **3** Make sure the switches are on NORM, OFF (between REM_LP and LOC_LP), 9600, and ASYN. **4** If the test still aborts, replace the Date Module. **5** If the same abort code appears, replace the Digital Line circuit pack that is connected to the Data Module.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Data received from remote loop back does not match data sent. **1** Check for faulty wiring. **2** Replace the data module and repeat the test. **3** If the test fails, replace the Digital Line circuit pack associated with the data module and repeat the test.

S8100

Table 622: Test #175 Data Module Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	Could not get translation information for port. **1** Verify that port circuit is administered. **2** Wait one minute and attempt the test again. **3** If the test continues to abort and the port is not in use, escalate the problem.
1005	ABORT	This test is not applicable to the given hardware configuration. **1** This abort message can be ignored.
1020	ABORT	Internal Software Error. **1** Retry the command at one-minute intervals a maximum of 5 times.
1030	ABORT	Internal software group identifier for data module not valid. **1** Verify that port circuit is administered correctly. **2** If administration data correct, escalate the problem.
1031 1032	ABORT ABORT	Extension number not valid. Extension number not correct length. **1** Verify that the data module extension is administered correctly. **2** If the administration data is correct, escalate the problem.
1071	ABORT	No auxiliary port on Netcon circuit pack available to test with. **1** Check that the Netcon data channels are administered (the **list data-modules** command should show at least one Netcon-type data module). **2** Test the Network Control (Netcon) circuit pack using the **test data-module** command for the Netcon circuit pack. **3** If administration data is correct, escalate the problem.
2000	ABORT	Data module disconnected. **1** Verify that the data module is powered (power LED on). **2** Make sure data module is connected to the building wiring. Check for faulty wiring and faulty data module. **3** Retry the command at one-minute intervals a maximum of 5 times. **4** Replace the Data Module and repeat the test. **5** If the test continues to abort, replace the Digital Line circuit pack and repeat the test.
2500	ABORT	Internal System Error. **1** Retry the command at 1-minute intervals a maximum of 5 times.

Table 622: Test #175 Data Module Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
3004	ABORT	**1** This error could be caused by the switch setting of the PDM. Verify that the switch on the PDM is set to the "remote loop" position. When the remote loop around test is completed, return the switch to the "off" position. **2** This error could be caused by the Network Control Data Channel. Look for DATA-CHL errors in the Hardware Error Log. **3** This error could also result if no data equipment is connected to the data module. Verify that (a) the data equipment is properly connected to the data module, (b) that power is available to the data equipment, and that (c) the data equipment is powered on. **4** This error could also occur if the baud rate of the data module is set to 19.2 Kbps since the Network Control circuit pack used by this test does not support baud rates greater than 9600 bps. Verify that the baud rate of the data module is set to 9600 bps or less.
1040	FAIL	Data received from remote loop back does not match data sent. **1** Check for faulty wiring. **2** Replace the data module and repeat the test. **3** If the test fails, replace the Digital Line circuit pack associated with the data module and repeat the test.
1070	FAIL	Internal software response. **1** Wait one minute and attempt the test again. **2** If the same error persists after five attempts in one-minute intervals, escalate the problem.
1072	FAIL	Poor response from auxiliary channel. **1** Test the Network Control (Netcon) circuit pack using the **test data-module** command. **2** If the test fails, replace the Digital Line circuit pack.
1073	FAIL	Internal System Error. **1** Wait one minute and attempt the test again. **2** If the same error persists after five attempts in one-minute intervals, escalate the problem.
1074	FAIL	Internal System Error. **1** Make sure that the data equipment connected to the data module is powered. **2** For an (M)PDM, verify that the Data Terminal “Ready” LED is ON, or for an (M)TDM, verify that the Data Set Ready LED is ON. If it is not on, check the cable from the data equipment to the data module.

Table 622: Test #175 Data Module Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
1075	FAIL	Unknown message received during test. **1** Attempt the test again. **2** If the same error occurs, test the Network Control Data Channel using the **test data-module** command and a known working data module. **3** Replace the Digital Line circuit pack and repeat the test. **4** If the test continues to fail, escalate the problem.
2040	FAIL	Internal System Error.
2095	FAIL	Internal System Error. **1** Repeat the test.
	PASS	Data Module Loop-around test passed.

PE-BCHL (PRI Endpoint Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
PE-BCHL[1]	MINOR	**test port *location* l**	PRI Endpoint Port
PE-BCHL	WARNING	**test port *location* sh**	PRI Endpoint Port

1 For information on specifying a ***location***, see Command Syntax on page 179. For additional repair information, see also UDS1-BD and Troubleshooting ISDN-PRI endpoints (wideband) in Chapter 6, "Troubleshooting" in *Maintenance Procedures (555-245-103)*.

A PRI endpoint provides ISDN-PRI (Primary Rate Interface) connections application equipment or terminal adapters that terminate ISDN PRI. The equipment or terminal adapters are connected to the switch via the TN464C/D UDS1 interface circuit pack. This MO monitors the PRI endpoint's port hardware on the UDS1 circuit pack by:

- Logging hardware errors
- Running tests for port initialization
- Running periodic and scheduled maintenance
- Executing demand tests

Wideband Switching

Wideband switching supports end-to-end connectivity between customer endpoints at data rates from 128 to 1536 kbps over T1 facilities and to 1984 kbps over E1 facilities. Switching capabilities support wideband calls comprised of multiple DS0s that are switched end-to-end as a single entity.

Wideband switching is designed for ISDN application equipment such as ISDN video codecs, but can also interface to non-ISDN application equipment by using PRI terminal adapters. In the same sense that a data module acts as a DCP or BRI terminal adapter between endpoint data, such as V.35 and dialing interfaces such as RS-366 and a DCP interface, a PRI terminal adapter acts as a wideband terminal adapter between endpoint data and dialing interfaces and a line-side ISDN-PRI interface. Wideband switching introduces PRI endpoints on line-side interfaces.

A PRI endpoint has a unique extension number and consists of one or more contiguous B channels on a line-side T1 or E1 ISDN-PRI facility. Endpoints initiate and receive calls via ISDN SETUP messages indicating the data rate and specific B channels to be used, and communicate all other call status information via standard ISDN messages. Any ISDN signaling set such as Avaya, CCITT, or ECMA may be used for a line-side ISDN-PRI facility.

Multiple PRI endpoints on one line-side facility are separate and distinct within the facility. Non-overlapping contiguous sets of B channels are associated with each PRI endpoint, and the endpoint equipment is expected to initiate calls within these boundaries. The endpoint application equipment must:

- Use standard ISDN-PRI signaling
- Adhere to the administered PRI endpoint boundaries when initiating calls
- Handle incoming calls appropriately, based on the originating PRI endpoint

Signaling and B-Channel States

PRI ports use a separate channel called the D channel for call-control and signaling messages. This is called out-of-band signaling. The D channel associated with the set of B channels is an ISDN-PRI signaling link's port (ISDN-LNK). The signaling protocol used on the ISDN-PRI signaling-link port's D channel is defined by one of the four selectable ISDN-PRI Specifications: Avaya, CCITT, ECMA, and ANSI.

The ISDN-PRI Specification defines the possible service states for a B channel. The service state is negotiated with the far-end terminal adapter, changes over time, and can have far- and near-end components. The service state is initialized to Out-Of-Service/Far-End, and an attempt is made to negotiate it to In-Service. Use **status pri-endpoint *extension*** to display the service state of a particular PRI endpoint port's B channel.

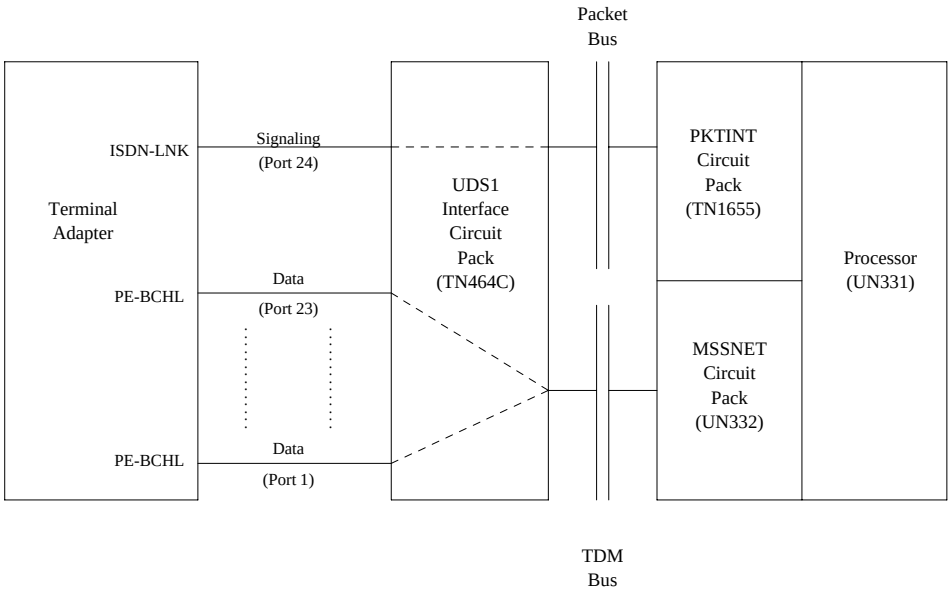
If a call is present, the Specification defines the permissible call states as well. There are tests in the short and long test sequences for the PRI endpoint port designed to audit these states and ensure agreement between both ends of the PRI wideband connection.

Alarming Based on Service States

A PRI endpoint port's B channel logs a warning alarm when it is placed in a Maintenance/Far-End or Out-Of-Service/Far-End state. While in such a state, the port is unusable for calls to the terminal adapter. However, the user can still use the other remaining ports in the PRI endpoint to make calls to and from the terminal adapter. When a warning alarm is raised, use **status pri-endpoint *extension*** to determine the exact state of the port. Other alarms can be diagnosed by using the short and long test sequences. Note that a PRI endpoint port's B channel can be placed in a far-end service state by direct action by the far-end terminal adapter or by inaction of the far-end terminal adapter. For example, if it does not respond to a Remote Layer 3 Query (see Test #260 for ISDN-LNK) the associated PRI endpoint port's B channels will be placed in the Maintenance/Far-End service state.

A PRI endpoint port is a port on a UDS1 interface circuit pack and thus depends on the health of the circuit pack for proper operation (see the following figure). A problem on the associated ISDN-LNK's (ISDN-PRI signaling-link port's) D channel can also affect the PRI endpoint. In turn, the ISDN-LNK depends on the SYS-LINK (system link) to the packet interface. Keep this hierarchy of dependencies in mind when diagnosing problems.

Figure 107: PRI Endpoint Port Interactions



PRI Endpoint Port Service States

The **status pri-endpoint *extension*** command displays the following possible service states for PRI endpoint ports. The table that follows gives recommended procedures for each state. The figure following that shows typical progressions from one service state to another. Refer also to Troubleshooting ISDN-PRI endpoints (wideband) in Maintenance Procedures (555-245-103) for a layered approach to addressing PRI endpoint problems.

- In-Service (INS)

  The B channel is in its normal operating state.

- Out-of-Service/Far-End (OOS/FE)

  A B channel is initialized to this state when first administered. The switch then sends messages to the far-end terminal adapter to negotiate the B channel into service. If the far-end terminal adapter does not respond to the messages within a certain time period, the port remains out of service, and maintenance will periodically resend the messages. The port is unusable for incoming and outgoing calls, although other ports in the PRI endpoint can still be used.

- Out-of-Service/Near-End (OOS/NE)

  This is the state of the port when a hardware failure exists on the signaling link, the NPE Crosstalk test fails, or when the port is busied out by command. In this state, the port is unusable for calls coming into the switch or going out to the terminal adapter, although other ports in the PRI endpoint can still be used for incoming and outgoing calls. No messages are sent to the far-end terminal adapter until the signaling link comes back into service or the port is released by command.

- Maintenance/Far-End (MTC/FE)

  This state is reached when the far-end terminal adapter does not respond to messages sent over the signaling link for a particular port within a certain amount of time. This state is different from OOS/FE since the signaling link must have initially been up and the B channels in service. The

switch will periodically send messages to the far-end terminal adapter to try to negotiate the port (B channel) into service. The port is unusable for outgoing calls to the terminal adapter but will service incoming call requests from the far end. Other ports of the PRI endpoint can still to place outgoing calls to the terminal adapter. Transitions into MTC/FE do not drop stable calls. If the service state changes from in-service to MTC/FE, stable calls are unaffected.

- Maintenance/Near-End (MTC/NE)

  Use **busyout**, **test port l** or **test pri-endpoint l** to busy out the signaling link (SYS-LINK) (**S8100**: PKT-INT). Transitions into MTC/NE do not drop stable calls. The **busyout link *lnk-no*** command does not drop stable wideband calls. In this state, the B channel is not usable for new incoming calls to the switch or new outgoing calls to the terminal adapter.

- Pending States (PEND)

  If the near end is expecting a timed response from the far end for a request to change the service state of a port, a *pending* state is in effect. For example, if the port is out-of-service/far-end and an in-service message was sent to the far end, then the service state of the port is OOS/FE-PEND/INS meaning out-of-service/far-end, pending/in-service. The service state will reflect this pending state until the far end responds or the timer expires.

Table 623: PRI Endpoint Port Service States

Service State[1]	Alarm	Possible Cause	Possible Solution
OOS/NE	Warning	Port has been busied out by command.	Enter **release pri-endpoint *extension***.
	Minor	NPE Crosstalk test (#6) failed.	Replace UDS1 circuit pack.
		UDS1 circuit pack lost its signal.	Is the UDS1 circuit pack removed? Is the UDS1 cable disconnected? Is the far-end terminal restarting or experiencing problems? Check circuit pack using UDS1-BD procedure.
OOS/FE	Warning	Far-end problems or incompatibility	Check administration and status of the corresponding port on the terminal adapter.
	Warning	The far-end port is busied out.	Check the status of the far-end terminal adapter.
OOS/FE PINS		Service message was sent and the switch is waiting up to 2 minutes for a reply from the far-end terminal adapter.	Wait 2 minutes, and check service state after the PINS state has cleared.
MTC/NE		System link demand busied out	Check link status. Release with **release link *link#***.
MTC/FE	Warning	Signaling channel has been down for over 90 sec.	Consult ISDN-SGRP, ISDN-LNK and/or SYS-LINK. Far-end terminal adapter may currently be restarting.
	Warning	Repeated failure of far end to respond to messages.	Maintenance software will periodically try to resend messages. You can speed the process with **test port *UUCSSpp*** (Test #256).

1 of 2

Table 623: PRI Endpoint Port Service States

Service State[1]	Alarm	Possible Cause	Possible Solution
	Warning	The far-end port is being tested.	Check status of the far-end terminal adapter.
MTC/FE PINS		Service message was sent, and the switch is waiting up to 2 minutes for a reply from the far-end terminal adapter.	Wait 2 minutes, and check service state after the PINS state has cleared.
INS		Normal operating state. ISDN wideband calls are completing.	

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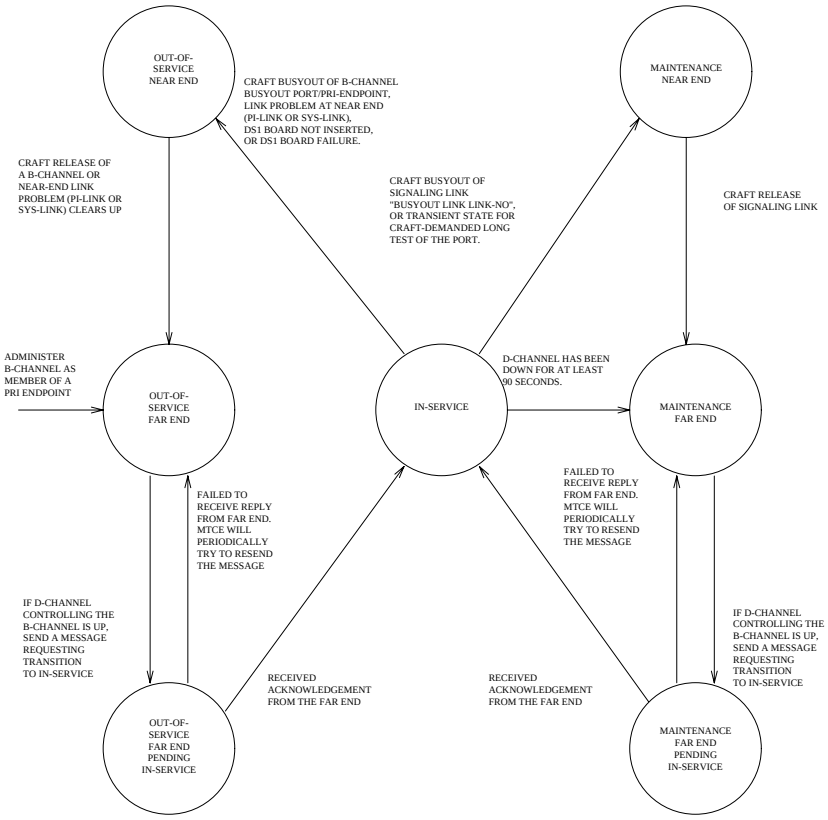
1 OOS Out-of-Service MTC Maintenance FE Far-end
NE Near-end PINS Pending in-service

Figure 108: Common Progressions in PRI Endpoint Service States



Error Log Entries and Test to Clear Values

Table 624: PRI endpoint port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port *UUCSSpp* sh r 1**
1 (a)	Any	None			**test port *UUCSSpp* sh r 1**
15 (b)	Any	Audit and Update test (#36)			
18 (c)	0	**busyout pri-endpoint *extension*** **busyout port *UUCSSpp***			**release pri-endpoint *extension*** **release port *UUCSSpp***
129 (c) **S8100**: 129 (d)		None	WARNING	OFF	**test port *UUCSSpp* sh r 1**
130 (d) **S8100**: 130 (e)		None	WARNING	ON	**test port *UUCSSpp* sh**
257 (e) **S8100**: 257 (f)	Any	None			**test port *UUCSSpp* sh r 1**
513 (f) **S8100**: 513 (g)	Any	None	WARNING	OFF	**test port *UUCSSpp* sh r 1**
769 (f)	Any	None			**test port *UUCSSpp* sh r 1**
1281 (h)	Any	Conference Circuit test (#7)	MINOR	ON	**test port *UUCSSpp* l r 4**
1537 (i)	Any	NPE Crosstalk test (#6)	MINOR	ON	**test port *UUCSSpp* l r 3**
1793 (j)	Any	None			**test port *UUCSSpp* sh r 1**
3073 (k)	Any	Service State audit (#256)			**test port *UUCSSpp* sh r 2**
3585 (l)	Any	None			None

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Error Notes:

a These error types indicate a disagreement between this switch and the terminal adapter at the other end of the connection with regard to the ISDN *call* state of the PRI endpoint port. This switch will automatically try to recover by clearing the call (the call will be torn down). Use **status pri-endpoint *extension*** to determine the state of the port.

When running the short test sequence, pay close attention to the results of the Call State Audit test (#257).

b This is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors.

c The PRI endpoint port has been busied out by **busyout pri-endpoint *extension*** or **busyout port *UUCSSpp***. No wideband calls can be made to this port, although wideband calls can still be made to other ports within this PRI endpoint if they are in service.

d The far-end terminal adapter changed its ISDN *service* state to out-of-service or maintenance. This may be a temporary condition due to testing of this port by the far-end terminal adapter *or* a hardware problem with the port. Outgoing calls to the terminal adapter will not be allowed over the port, although calls can still be made to other ports that are in service within the same PRI endpoint. To investigate the status of the port, enter **status pri-endpoint *extension***.

e This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

f These error types indicate a disagreement between this switch and the terminal adapter at the other end of the connection with regard to the ISDN service state of the PRI endpoint port. The switch will automatically try to recover by performing a service state audit. Use **status pri-endpoint *extension*** to determine the state of the port.

When running the short test sequence, pay close attention to the results of the Service State Audit test (#256).

g This port is not recognized by the far-end terminal adapter. Investigate the PRI endpoint administration for both the switch and the terminal adapter, and make sure they agree.

h The Conference Circuit test (#7) failed on this port. See Test #7 for repair procedures.

i The NPE Crosstalk test (#6) failed on this port. See Test #6 for repair procedures.

j This error indicates a failure of the UDS1 Interface circuit pack. The results of the Signaling Link State Check test (#255 in the short sequence) are important.

k Two Service State audit attempts have failed (see Test #256). The port will not be usable for any outgoing calls to the terminal adapter until the test passes and the port state is changed to in-service. Incoming calls from the terminal adapter *will* be accepted over this port, and other ports in the PRI endpoint can still be used for both incoming and outgoing calls to and from the terminal adapter.

l Error Type 3585 appears when the switch receives an ISDN RESTART message for an ISDN port that is not idle. Since calls are not typically cleared with the RESTART message, this error type may be associated with a dropped call report from a user.

The following Aux Data values for Error Type 3585 represent the port's ISDN call state at the time the unexpected RESTART request was received from the terminal adapter. This information can be useful if dropped calls are being reported by users of the PRI endpoint. Aux values that do not appear below can be ignored.

Table 625: PE-BCHL Error 3585 Aux Data

Aux Data	Meaning
10	A call in a stable, talking state (the *active* state) was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
4, 7, 8, 260, 263	A call that has not reached the active state, but has at least reached a ringing state, was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
1, 3, 6, 265 **S8100**: 9	A call that has not yet reached a ringing state was cleared unexpectedly by the far-end terminal adapter with an ISDN RESTART message.
11, 12, 19, 531, 267, 268	A call that was already in the process of clearing has been cleared by the far-end terminal adapter with an ISDN RESTART message. If this condition occurs frequently, it may mean that the far-end terminal adapter is attempting to clear ports that it thinks are in a "hung" state. The RESTART message puts the port in an idle condition.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the NPE Crosstalk test (#6), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6)		X	ND
Conference Circuit test (#7)		X	ND
Audit and Update test (#36)	X	X	ND
Signaling Link State Check test (#255)	X	X	ND
Service State Audit test (#256)	X	X	ND
Call State Audit test (#257)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may be observed. This test is usually part of a port's long test sequence and takes about 20 to 30 seconds to complete.

Table 626: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status pri-endpoint *extension*** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-Bus errors. Use the **status health** command to determine whether the system is experiencing heavy traffic. Investigate and resolve any errors against TDM-BUS. **1** If the system has no TDM-Bus errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.

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Table 626: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some tone detectors may be out-of-service. The **list measurements tone-receiver** command will display information about the system's tone receiver. **1** Resolve any errors against TTR-LEV. **2** Resolve any errors against TONE-PT. **3** If neither of the above exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status pri-endpoint *extension*** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1117	ABORT	A service state audit message is outstanding. **1** Wait 2 minutes and then try again.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2020	ABORT	The test did not run due to an existing error on the specific port or a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or the circuit pack, and follow recommended procedures.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. The PE-BCHL is moved to out-of-service/near-end state. **1** Replace the circuit pack.
	PASS	The port can communicate over the TDM bus.

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Conference Circuit Test (#7)

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is measured by a tone detector port. If the level of the tone is within a certain range, the test passes.

Table 627: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 627: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status pri-endpoint *extension*** commands to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use **status pri-endpoint *extension*** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This will cause noisy and unreliable connections. **1** Replace the circuit pack. Even though wideband calls do not use the conferencing feature on the NPE, this failure indicates problems with the circuit pack hardware.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and examining terminal adapter or external wiring.

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Audit and Update Test (#36)

This test sends port level translation data from switch processor to the UDS1 interface circuit pack to assure that the port's translation is correct. The port audit operation verifies the consistency of the current state of port kept in the UDS1 interface circuit pack and in the switch software.

Table 628: Test #36 Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	FAIL	Test failed due to internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 628: Test #36 Audit and Update Test

Error Code	Test Result	Description / Recommendation
	PASS	Port translation has been updated successfully. The current port states kept in the UDS1 interface circuit pack and switch software are consistent. If the port is busied out, the test will not run, but will return PASS. To verify that the port is in-service: **1** Enter **status pri-endpoint *extension*** to verify that the port is in-service. If the port is in-service, no further action is necessary. If the port is out-of-service, continue to Step 2. **2** Enter **release pri-endpoint *extension*** or **release port *UUCSSpp*** command to put port back into in-service. **3** Retry the test command.

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Signaling Link State Check Test (#255)

As noted in the preceding general description, operation of the PRI endpoint port depends on the health of the UDS1 interface circuit pack and System Link for proper operation. This test checks the status of those critical elements.

Table 629: Test #255 Signaling Link State Check Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. **1** Either reconnect the disconnected PRI terminal adapter or disable the rollabout video feature on this circuit pack. To do the latter, enter **change ds1 *UUCSS*** and set the `Alarm when PRI Endpoint Detached` field to **y**.
4	FAIL	There is a problem with the Signaling Channel and/or with the System Link. **1** Consult procedures for the ISDN-GRP and SYS-LINK. See also ISDN-LNK for useful information.
8	FAIL	There is a problem with the UDS1 interface circuit pack. **1** Consult procedures for UDS1-BD.
	PASS	The signaling link hardware is OK.

Service State Audit (#256)

As noted in the general description for PRI endpoint port, these ports may be in one of several service states as defined by the ISDN-PRI Specification. This test performs a service state audit with the far-end terminal adapter to ensure both sides agree on the service state.

A PASS for this test simply means that an audit message was successfully composed and sent out to the far-end terminal adapter. The ISDN Specification allows up to 2 minutes for a reply. If no reply is received within that 2-minute window, this switch will automatically try once again. If that attempt fails, an error will be logged (Error Type 3073) and the switch will then attempt recovery by automatically retrying approximately every 15 minutes. If the port was initially in the INS (in-service) state, it will now be placed in the MTC/FE (maintenance state, far-end problem) state. Until a Service State audit attempt is successful, no outgoing calls will be placed over this port, but incoming calls will be accepted. The service state of this port does not affect the service state of other ports in the PRI endpoint. If an incoming call that uses this port is presented while in such a state, a Service State audit attempt will immediately be attempted (that is, the switch will not wait for the 15-minute cycle, but will instead try to recover immediately). To investigate the status of this PRI endpoint port, issue the **status pri-endpoint *extension*** command.

Table 630: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this port. **1** Check the results of Test #255 (Signaling Link State Check).
1117	ABORT	A service state audit message is outstanding. **1** Wait 2 minutes and then try again.
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. **1** Either reconnect the disconnected PRI terminal adapter or disable the rollabout video feature on this circuit pack. To do the latter, enter **change ds1 *UUCSS*** and set the `Alarm when PRI Endpoint Detached?` field to y.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

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Table 630: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
	PASS	Wait 4 minutes and then check the Error Log for any new errors of type 3073. If there are none, then both sides of the ISDN connection agree on the service state; the negotiation succeeded. If there is a new 3073 error, then the negotiation failed (the far-end terminal adapter twice failed to respond within the mandatory 2-minute window). This switch will automatically retry approximately every 15 minutes. If the port was initially in the INS (in-service) state, it will now be placed in the MTC/FE (maintenance, far-end problem) state (see the "Service States" section which precedes the PE-BCHL "Hardware Error Log Entries and Test to Clear Values" table); incoming calls will be accepted, but no outgoing calls will be originated this port. If an incoming call is presented, another Service State audit will be immediately performed in an attempt to bring the PRI endpoint port the proper state.

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Call State Audit Test (#257)

If a call is active on the port, the switches on both sides of the connection should agree on the ISDN state of the call as defined in the ISDN Protocol Specification. This test audits internal call state data by querying the far-end terminal adapter as to the ISDN state of the call. It can be helpful when trying to clear a hung call. If the internal call state data on the near-end switch is different than that of the far-end terminal adapter, the call will be **torn down**.

As with Test #256 (Service State audit), a PASS simply means that an appropriate message was composed and sent to the far-end terminal adapter. The ISDN Specification allows up to 2 minutes for a reply. If a reply is not received within the 2-minute window, a protocol time-out violation is recorded in the error log against the associated signaling channel (ISDN-PRI signaling link's port, which is listed in the Error Log as ISDN-LNK; the Error Type is 1).

Table 631: Test #257 Call State Audit Test

Error Code	Test Result	Description / Recommendation
1019	ABORT	An audit is already in progress. **1** Wait 2 minutes and try again.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this port. **1** Check the results of Signaling Link State Check test (#255).
1116	ABORT	The port is in an out-of-service ISDN service state. **1** A call cannot be present if the port is in an ISDN out-of-service state, so a call state audit would be inappropriate. No action necessary. Use **status pri-endpoint *extension*** to investigate the ISDN state of the port.

1 of 2

Table 631: Test #257 Call State Audit Test

Error Code	Test Result	Description / Recommendation
1700	ABORT	Rollabout video abort. The PRI terminal adapter associated with this PRI endpoint extension is detached from the circuit pack. This is a normal abort when the rollabout video feature is enabled. **1** Reconnect the disconnected PRI terminal adapter or disable the rollabout video feature on this circuit pack. To do the latter, enter **change ds1 *UUCSS*** and set the `Alarm when PRI Endpoint Detached` field to **y**.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	This switch sent a call-state auditing message to the far-end terminal adapter to verify the state of the call active on this port. If a call-state mismatch is found, then the call is torn down within two minutes. If no call was active, then no message was sent.

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PKT-BUS (Packet Bus)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
PKT-BUS	MAJOR	**test pkt *P* l r 2**[1]	Packet Bus
PKT-BUS	MINOR	**test pkt *P* l**	Packet Bus
PKT-BUS	WARNING	**test pkt *P* l**	Packet Bus

1 where ***P*** is the port-network number indicated in the PORT field from the Alarm or Error Log.

The packet bus consists of a single bus, and one such bus appears in each port network. The packet bus in each port network is physically independent from those in other port networks, so each port network has a separate PKT-BUS MO. This bus supports the following types of connections:

- Logical control links between the media server and every PN
- ISDN-BRI D-channel transport (signaling)
- ASAI D-channel transport (signaling)
- ISDN-PRI D-channel (signaling)
- X.25 system adjunct signaling and traffic
- System Access Ports

The TN2312AP IPSI circuit pack's Packet Interface circuit provides the media server an interface to the packet bus. Packet-bus testing depends on the TN771D Maintenance/Test circuit pack, the TN2312AP IPSI circuit pack's Packet Interface circuit, TN570 Expansion Interface circuit pack, and various port circuit packs (including TN556 ISDN-BRI Line, TN553 Packet Data Line, and TN464 Universal DS1). Packet Bus tests may abort if some of these are absent from the system. The tests may yield inconsistent results if any of this hardware is defective. The individual test descriptions provide more information.

The interactions between the packet bus and the circuit packs that use the bus are complex. Circuit pack failures can alarm the packet bus, while packet-bus faults can alarm or interrupt service to one or more circuit packs and their ports and endpoints. The Isolating and repairing packet-bus faults in Maintenance Procedures (555-245-103) describes packet-bus maintenance and interactions with circuit packs. That section should be referenced for all troubleshooting and repairs. The flowchart is the normal starting point for experienced technicians.

This section on the PKT-BUS MO is limited to a description of the Error and Alarm Log entries and the test sequence for the packet bus. The following list summarizes some of the important points to consider when working with the packet bus.

- The Maintenance/Test circuit pack (TN771D) is a critical tool for isolating packet bus faults. This circuit pack resides in each port network of a critical-reliability system (duplicated servers *and* PNC). If a TN771D is absent, *one must be taken to the customer site* to allow for proper fault isolation. 'Isolating and repairing packet-bus faults in Maintenance Procedures (555-245-103) describes the Packet Bus testing facilities of the TN771D and when one must be taken to the customer site.
- Certain catastrophic packet-bus faults have an effect on maintenance software activities relating to packet circuit packs, ports, and endpoints:

- Packet circuit pack (BRI-BD, UDS1-BD) in-line errors indicating possible Packet Bus test failures are logged in the error log, but are not acted upon.
- Port-level (BRI-PORT, ABRI-PORT) in-line errors on Packet circuit packs which indicate possible Packet Bus failures are not logged or acted upon.
- Circuit pack and port in-line errors that are not relevant to the Packet Bus, or that indicate a circuit pack failure, are acted upon in the normal fashion.
- Periodic and scheduled background maintenance are not affected.
- Foreground maintenance (for example, a **test board** command executed at a terminal) is not affected.

The actions in the previous list serve to reduce the system load, which could become excessive if many MOs are affected by a packet bus failure. However, such an excessive load should in no way impede the isolation and the correction of the faults.

When the above actions are implemented, Error Type 3329 is logged against PKT-BUS, and a Warning alarm is raised. Other Packet Bus errors may raise more severe alarms, thereby overriding the Warning alarm.

- **S8700 MC**: Since all packet traffic requires communication with the IPSI's PKT-INT circuit in an IPSI-connected PN, a PKT-BUS failure in the IPSI-connected PN causes packet traffic in this PN, and every PN controlled by the IPSI-connected PN, to fail. In the S8700 Multi-Connect configuration where some PNs are non-IPSI-connected, an IPSI-connected PN PKT-BUS fault should be investigated first whenever PKT-BUS problems occur in multiple PNs.

Hardware Error Log Entries and Test to Clear Value

Table 632: PKT-BUS Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Test to Clear Value
0[2]	0	Any	Any	Any	**test pkt port-network**
1 (a)	1–2	Packet circuit pack Audit test (#570)	MAJOR	ON	**test pkt port-network** *P* **l r 2**
513 (b)	1–24	Maintenance/Test Circuit Pack Query test (#572)	MAJOR	ON	**test pkt port-network** *P* **l r 2**
1793 (c)	Any	None			
2049 (d)	1–3	Maintenance/Test Circuit Pack Query test (#572)	MINOR	ON	**test pkt port-network** *P* **l r 2**
2305 (e)	1–24	Maintenance/Test Circuit Pack Query test (#572)			**test pkt port-network** *P* **l**
3329 (f)	1–7	none	WARNING	ON	**test pkt port-network** *P* **l**
3585 (g)	Any	none	MINOR	ON	**test pkt port-network** *P* **l**
3841 (h)	Any	none	MINOR	OFF	

1 ON-BOARD indicates a problem with the packet bus itself.

2 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a Within the last minute, packet circuit packs have reported errors that indicate a possible packet bus failure. The Aux Data value is 1 or 2, indicating that only one or more than one Packet circuit pack (respectively) have reported a possible packet bus failure.

b The Maintenance/Test packet bus port (M/T-PKT) for this port network has determined that there are more packet bus faults than the port can correct. The Aux Data value indicates the number of faulty leads.

c Packet circuit packs have detected possible packet bus failures via in-line error or via background test failure. Examine the Error and Alarm logs for more specific PKT-BUS errors.

d **S8700 MC**: The Maintenance/Test packet bus port (M/T-PKT) has detected a Packet Bus fault and has taken corrective action by swapping to spare leads. This error appears only in high/critical-reliability systems (duplicated PNC). The Aux Data value indicates the number of faulty leads. If this is the only active error against the packet bus, *the packet bus is still in service*. Due to the disruptive nature of the packet bus Fault Isolation and Correction procedures, repairs should be deferred until a time when the least interruption in service would result. This should be determined by consultation with the customer. However, do not delay repairs for too long, since the switch cannot recover from another packet bus failure until the current one is resolved. 'Isolating and repairing packet-bus faults in Maintenance Procedures (555-245-103) contains a sub-section, *A Special Precaution Concerning the TN771D* that describes how to ensure that the TN771D is providing correct information. A new TN771D may need to be taken to the customer site.

e The Maintenance/Test packet bus port (M/T-PKT) has detected open leads on the packet bus. The Aux Data value indicates the number of open leads.

f Packet circuit pack, port, and endpoint maintenance has been disabled due to a packet bus failure. The Aux Data value indicates the cause:

Aux Data	Cause
1	In-line errors from packet circuit packs
2	Uncorrectable packet-bus fault reported
	Maintenance/Test packet-bus port (M/T-PKT)
3	Both of the above
100*x*	Packet-related circuit pack, port, and endpoint maintenance in the PN has been disabled due to a packet-bus failure in the PN. The last digit has the same meaning as the single digits listed above.

Keep in mind that although only packet circuit packs can detect and report packet bus problems, such problems can be caused by any circuit pack.

g Packet circuit pack, port, and endpoint maintenance has been disabled due to more than one circuit pack reporting in-line errors. If this occurs more than three times in 15 minutes a Minor alarm is raised against the packet bus. This happens when maintenance is disabled due to errors and is then re-enabled because no more errors are reported.

This error may still be present in the error log even though the Packet Circuit Pack Audit test (#573) indicates that only one circuit pack is reporting a problem. This happens when more than one circuit pack has reported errors in any 1-minute interval since the packet bus fault occurred.

h The Maintenance/Test packet bus port (M/T-PKT) for this port network is not in service. This alarm does not appear for PNs in standard- or high-reliability systems since a TN771D is not required there. The error indicates one or more of the following:

- The packet bus port has been busied out (indicated by Error Type 18), and a Warning alarm is active against M/T-PKT in the same port network. Release the port by entering **release port *UUCSS*04**.
- The packet bus port has failed. Look for alarms against M/T-PKT, and attempt to resolve these alarms.
- The Maintenance/Test circuit pack was not recognized by the system at the last system restart. Replace the Maintenance/Test circuit pack.
- There is no Maintenance/Test circuit pack in this port network. One must be installed.

The TN711 must be installed before other packet bus alarms can be resolved. (Alarms against a given MO are not resolved until every alarm-generating condition has been cleared).

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables. For example, by clearing error codes associated with the Packet Circuit Pack Audit test (#573), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Circuit Pack Audit test (#573)	X	X	ND
Maintenance/Test Circuit Pack Query test (#572)	X	X	ND

1 D = Destructive; ND = Nondestructive

Maintenance/Test Circuit Pack Query Test (#572)

This test queries the Maintenance/Test packet bus port about the state of health of the packet bus. If the Maintenance/Test circuit pack indicates that the packet bus has faults, the test fails. The corresponding failure code describes the severity, type, and number of faults. The test passes if the packet bus is fault-free.

NOTE:
A Maintenance/Test circuit pack is usually absent from a standard-, duplex-, or high-reliability system's PNs. However, customers may optionally install a Maintenance/Test circuit pack both to utilize its enhanced analog-trunk and digital-line testing capabilities and to enhance the system's ability to quickly recognize a packet bus failure.

Table 633: Test #572 Maintenance/Test Circuit Pack Query Test

Error Code	Test Result	Description / Recommendation
1006	ABORT	The packet bus port of the Maintenance/Test circuit pack is out of service. **1** Determine whether the port is busied out. If so, release it with **release port *UUCSS*04**. Then retry the test command. **2** If there are alarms active against the packet bus port (MT-PKT), see M/T-PKT (Maintenance/Test Packet Bus Port) on page 1351 to resolve them. Then retry the test command.
1142	ABORT	No Maintenance/Test circuit pack packet bus port is in service in this PN. **1** If this PN is required by configuration guidelines to have a Maintenance/Test circuit pack: a. the Maintenance/Test circuit pack for this PN has failed, and should be replaced, b. the Maintenance/Test circuit pack has been busied out, and should be released, or c. there is no Maintenance/Test circuit pack in this PN, and one must be installed. **2** In a PN of a system without PNC duplication, the Maintenance/Test packet bus Port is not required and may not be present. If it is present, and is busied out, or has failed, release or replace the circuit pack. If there is no Maintenance/Test circuit pack, ignore the results of this test for this PN.

Table 633: Test #572 Maintenance/Test Circuit Pack Query Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	The test timed-out while waiting for an uplink CCMS response from the Maintenance/Test packet bus port. **1** Re-enter the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, check for problems with the Maintenance/Test packet bus port (look for M/T-PKT in the Error and Alarm Logs).
2059	ABORT	The Maintenance/Test packet bus port has reported a hardware failure. **1** See M/T-PKT (Maintenance/Test Packet Bus Port) on page 1351 to correct the problem. **2** Re-enter the test command.
2077	ABORT	The Maintenance/Test Circuit Pack Query located more than one Maintenance/Test packet bus port in the PN. The software should not allow this to occur. This is an internal system error. Escalate the problem, but also attempt the following work-around steps. **1** Remove every Maintenance/Test circuit pack from the PN. **2** Insert one Maintenance/Test circuit pack (there should not be more than one in a PN). **3** Re-enter the test command.
2100	ABORT	Maintenance could not allocate every necessary system resource to perform this test.
2500	ABORT	An internal operation failed; the test could not be completed. **1** Re-enter the command at 1-minute intervals up to 5 times.

2 of 3

Table 633: Test #572 Maintenance/Test Circuit Pack Query Test

Error Code	Test Result	Description / Recommendation
	FAIL	The Maintenance/Test packet bus port has detected faults on the Packet Bus. The error codes are interpreted as follows:
1*xxx*		The Maintenance/Test packet bus port has reconfigured the packet bus around the faulty leads. This action only occurs in a high- or critical-reliability system (duplicated PNC).
2*xxx*		The Maintenance/Test packet bus port is unable to correct every Packet Bus fault it has detected.
x**0***xx*		None of the packet bus faults are open faults.
x**1***xx*		At least some of the packet bus faults are open faults. Look for error type 2305 in the Error Log. The Aux Data value indicates the number of open leads.
xxyy		The last two digits of the error code indicate the total number of faulty packet bus leads detected. Examples: Error Code 2003 FAIL: The Maintenance/Test packet bus port has detected 3 faulty leads. None of them are opens. At least one was unable to be corrected. Error Code 1103 FAIL: The Maintenance/Test Packet Port has detected 3 faulty leads. At least one is an open. The Maintenance/Test circuit pack was able to correct all of them by reconfiguring. **1** See Isolating and repairing packet-bus faults in Maintenance Procedures (555-245-103).
	PASS	No faults have been detected on the packet bus by the Maintenance/Test circuit pack. This is an indication that the packet bus is operating correctly.

Packet Circuit Pack Audit Test (#573)

This test determines whether Packet circuit packs have reported Packet Bus-related in-line errors within the last minute. If so, the failure code indicates whether one or more than one circuit pack has reported such failures.

If the test has failed within the last 5 minutes, there is a 15 second delay before the result is returned. This prevents a repeated sequence of this test from always reporting the same result. If the test passes and a FAIL has not occurred within the last five minutes, a PASS is returned immediately.

Table 634: Test #573 Packet Circuit Pack Audit Test

Error Code	Test Result	Description / Recommendation
2500	ABORT	An internal operation failed; the test could not be repeated. **1** Re-enter the command at 1-minute intervals up to 5 times.
1	FAIL	One Packet circuit pack has reported packet bus-related in-line errors within the last minute.
2	FAIL	More than one Packet circuit pack has reported packet bus-related in-line errors within the last minute.
	PASS	No Packet circuit packs have reported packet bus-related in-line errors within the last minute. This indicates that the packet bus is healthy, or that a packet bus fault is transient or is being caused by a faulty Packet circuit pack. If this test passes, but there are other signs of a packet bus failure (for example, logged errors or alarms, or other test failures), see Isolating and repairing packet-bus faults in Maintenance Procedures (555-245-103).

PKT-BUS (Packet Bus - S8100)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PKT-BUS	MAJOR	**test pkt port l r 2**	Packet Bus
PKT-BUS	MINOR	**test pkt port l**	Packet Bus
PKT-BUS	WARNING	**test pkt port l**	Packet Bus

The Packet Bus consists of a single bus, and one such bus appears in the system. There is one instance of the Packet Bus maintenance object.

The Packet Bus is used to carry ISDN-BRI, ISDN-PRI, and ASAI signaling information. The SPE interface to the Packet Bus is the *second* Packet Interface instance (PKT-INT, instance1A2) on the TN2314 Processor Circuit Pack, which works in concert with the Bus Bridge circuitry on the TN799 C-LAN circuit pack to provide Packet Bus access. Packet Bus maintenance is performed only when the `Packet Intf2?` field on the Maintenance-Related System Parameters form is set to `y`. Packet Bus testing is dependent on the following hardware components:

- TN2314 Processor circuit pack, PKT-INT instance 1A2
- TN556 ISDN-BRI Line circuit pack

Packet Bus tests may abort if some of this hardware is not present in the system. Also, these tests may yield inconsistent results if some of this hardware is defective.

The interactions between the Packet Bus and the circuit packs that use the bus are complex. For this reason, the Packet Bus can be alarmed due to a circuit pack failure and, conversely, circuit packs can be alarmed due to a Packet Bus failure. This section on PKT-BUS is limited to a description of the Error and Alarm Log entries for the Packet Bus maintenance object and to a description of the Packet Bus test sequence.

NOTE:
Refer to Chapter 7, “Packet and serial bus maintenance” in *Maintenance Procedures (555-245-103)* for a complete discussion of Packet Bus maintenance and also the interactions of the bus with the Packet circuit packs. The chapter discusses fault isolation and correction procedures, and it should be referenced for all procedures and required decisions. The “Packet Bus Fault Isolation Flowchart” section of the chapter is the normal starting point for experienced technicians; however, technicians who are unfamiliar with the Packet Bus and its use should refer to the introductory material.

A failure of one or more circuit packs that use the Packet Bus can cause a Packet Bus alarm. In addition, a Packet Bus failure can cause loss of service to one or more such circuit packs, as well as to the ports and endpoints associated with the ISDN-BRI circuit pack (BRI-PORT, ABRI-PORT, BRI-SET, BRI-DAT, and ASAI-ADJ). These interactions are discussed in Circuit packs that use the packet bus in *Maintenance Procedures (555-245-103)*.

The following list summarizes some of the important points to consider when working with the Packet Bus.

- The Maintenance/Test circuit pack (TN771) is a critical tool for isolating Packet Bus faults. The circuit pack is optional, and is not present in all systems. If a TN771 is not present, **one must be taken to the customer site** to allow for proper fault isolation. (A determination as to whether a TN771 circuit pack is in the system is made by entering the **list configuration** command.) Use of the Maintenance/Test Packet Bus port facilities is described under "The Maintenance/Test Circuit Pack (TN771)" in the above referenced chapter. Also, in the same chapter, the section entitled "Special Precautions Concerning the TN771" describes other circumstances when a TN771 must be taken to the customer site.
- Certain catastrophic failures of a Packet Bus can cause all the Packet circuit packs on that bus to report errors, thus generating a high volume of maintenance activity for maintenance objects that are healthy. In order to reduce this unnecessary activity, some maintenance for Packet circuit packs, ports, and endpoints is curtailed or disabled when such a catastrophic Packet Bus failure is suspected. The following list summarizes the error-logging and testing impact of this strategy:

  a In-line errors indicating possible Packet Bus failures are placed into the error log, but are *not* acted upon. *Circuit pack* maintenance objects thus affected include:

  - ASAI-BD (Multi-Application Platform Board) on page 331
  - BRI-BD/LGATE-BD (ISDN-BRI Line Circuit Pack) on page 491
  - CLAN-BD (Control LAN Circuit Pack) on page 599
  - UDS1-BD (UDS1 Interface Circuit Pack) on page 1950
  - MEDPROPT (TN802/TN2302 MED PRO DSP PORT) on page 1224

  b In-line errors indicating possible Packet Bus failures **are neither placed into the error log nor acted upon**. Circuit pack *port* and *endpoint* maintenance objects thus affected include:

  - BRI-PORT (ISDN-BRI Port), ABRI-PORT (ASAI ISDN-BRI Port) on page 499, BRI-SET, BRI-DAT, Various Adjuncts on page 520, TBRI-PT (ISDN Trunk-Side BRI Port) on page 1803
  - ASAI-ADJ (ASAI Adjunct) on page 330, ASAI-PT on page 341, ASAI-EPT on page 333
  - ATT-PORT, ATT-ADJ (AvayaAdjunct), ATTE-AJ (Ethernet Avaya Adjunct) on page 477, ATTE-PT, ATTE-AJ
  - LGATE-PT on page 1165
  - LGATE-AJ on page 1165
  - PGATE-PT
  - ETH-PT (Control LAN Ethernet) on page 895
  - PPP-PT (Control LAN Packet/Port) on page 1513
  - MEDPRO-RES

  c Circuit pack and port in-line errors that are not relevant to the Packet Bus or that indicate a circuit pack failure are acted upon in the normal fashion.

  d Normal background maintenance (periodic and scheduled) is not affected.

  e Foreground maintenance (for example, commands executed on the Manager I terminal) is not affected.

The actions in the previous list serve to reduce the system load, which could become excessive if too many maintenance objects are affected by a Packet Bus failure. However, such an excessive load should in no way impede the isolation and the correction of the faults.

When the actions in the list are implemented, Error Type 3329 is logged against PKT-BUS, and a Warning alarm is raised (although other Packet Bus errors in many cases raise more severe alarms, thereby overriding the Warning alarm).

Error Log Entries and Test to Clear Values

Table 635: PKT-BUS Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test pkt l
1 (a)	1-2	Packet Circuit Pack Audit Test (#570)	MAJOR	ON	test pkt p l r 2
513 (b)	1-24	Maintenance/Test Circuit Pack Query Test (#572)	MAJOR	ON	test pkt p l r 2
1793 (c)	Any	none			
2305 (d)	1-24	Maintenance/Test Circuit Pack Query Test (#572)			test pkt p l
3329 (e)	1-7	none	WARNING	ON	test pkt p l
3585 (f)	Any	none	MINOR	ON	test pkt p l

1 Run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

NOTE:
For PKT-BUS, an ON-BOARD alarm indicates a problem with the Packet Bus itself.

Notes:

a Within the last minute, packet circuit packs have reported errors that indicate a possible Packet Bus failure. The Aux Data value is 1 or 2, indicating that only one or more than one Packet circuit pack (respectively) have reported a possible Packet Bus failure.

b The Maintenance/Test Packet Bus port has determined that there are Packet Bus shorted-lead or stuck-lead faults. The Aux Data value indicates the number of faulty leads.

c Packet circuit packs have detected possible Packet Bus failures via in-line error or background test failure. Examine the Error and Alarm logs for more specific PKT-BUS errors.

d The Maintenance/Test Packet Bus port has detected open leads on the Packet Bus. The Aux Data value indicates the number of open leads.

e Packet circuit pack, port, and endpoint maintenance has been disabled due to a Packet Bus failure. The Aux Data value indicates which sources have reported errors that have caused maintenance to be disabled. These sources include the following:

- In-line errors from Packet circuit packs.
- Packet Bus fault report from the Maintenance/Test Packet Bus port.

The Aux Data values that indicate these sources are identified in the following table:

Aux Data	Packet Circuit Pack	Maint/Test Circuit Pack
1	X	
2		X
3	X	X
4		
5	X	
6		X
7	X	X

NOTE:
It is important to remember that problems reported by Packet circuit packs may be caused by **any** circuit pack. However, only Packet circuit packs can detect such problems (inasmuch as TDM-only circuit packs are not affected by these problems).

f Packet circuit pack, port, and endpoint maintenance has been disabled due to more than one circuit pack reporting in-line errors. If this occurs more than three times in 15 minutes (that is, if maintenance is disabled due to errors and then re-enabled because no more errors are reported), a Minor alarm is raised against the Packet Bus. Note that this error may still be present in the error log even if the “Circuit Pack Audit Test” reports that only one circuit pack has indicated a problem. This occurs if more than one circuit pack reported errors with in any one minute interval since the Packet Bus fault occurred.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when you are inspecting errors in the system. By clearing error codes associated with the *Packet Circuit Pack Audit Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Table 636: PKT-BUS System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Circuit Pack Audit Test (#573)	X	X	ND
Maintenance/Test Circuit Pack Query Test (#572)	X	X	ND

1 D = Destructive; ND = Nondestructive

Maintenance/Test Circuit Pack Query Test (#572)

This test queries the Maintenance/Test Packet Bus port about the state of health of the Packet Bus. If the Maintenance/Test circuit pack indicates that the Packet Bus has faults, the test fails. The corresponding failure code describes the severity, type, and number of faults. The test passes if the Packet Bus is fault-free.

NOTE:
A Maintenance/Test circuit pack is usually not present in the system unless the customer has purchased this circuit pack to use for ISDN-PRI test calls, or to enhance the system's ability to quickly recognize a Packet Bus failure.

Table 637: TEST #572 Maintenance/Test Circuit Pack Query Test

Error Code	Test Result	Description/ Recommendation
1006	ABORT	The Packet Bus port of the Maintenance/Test circuit pack is out of service. **1** Determine if the port is busied out. If so, release the port by entering the **release port *location*** command on page. Re-enter the test command.
1142	ABORT	No Maintenance/Test circuit pack Packet Bus port is in service in this system. **1** The Maintenance/Test Packet Bus Port may not be present. If the port is present, and if it is busied out or has failed, release or replace the circuit pack. If there is no Maintenance/Test circuit pack, ignore the results of this test.
2000	ABORT	The test timed-out while waiting for an uplink CCMS response from the Maintenance/Test Packet Bus port. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to abort, check for problems with the Maintenance/Test Packet Bus port.
2059	ABORT	The Maintenance/Test Packet Bus port has reported a hardware failure. **1** Re-enter the test command.
2077	ABORT	The Maintenance/Test Circuit Pack Query located more than one Maintenance/Test Packet Bus port in the system. The software should not allow this to occur. This is an Internal system error. Attempt the following work-around steps. **1** Remove all Maintenance/Test circuit packs from the system. **2** Insert one Maintenance/Test circuit pack (there should not be more than one in a system). **3** Re-enter the test command.

Table 637: TEST #572 Maintenance/Test Circuit Pack Query Test*Continued*

Error Code	Test Result	Description/ Recommendation
2100	ABORT	Maintenance could not allocate all of the necessary system resources to perform this test.
2500	ABORT	An internal operation failed; the test could not be completed. **1** Retry the command at 1-minute intervals a maximum of 5 times.
XYZZ	FAIL	The Maintenance/Test Packet Bus port has detected faults on the Packet Bus. The error code is encoded as follows:
1xxx		The Maintenance/Test Packet Bus port has reconfigured the Packet Bus around the faulty leads. This action occurs only in high or critical reliability systems, and such a failure code should not appear in an R8csi system.
2xxx		The Maintenance/Test Packet Bus port is unable to correct all of the Packet Bus faults it has detected.This action occurs only in high or critical reliability systems, and such a failure code should not appear in an R8csi system.
x0xx		None of the Packet Bus faults are open faults.
x1xx		At least some of the Packet Bus faults are open faults. Look for Error Type 2305 in the Error Log. The Aux Data value indicates the number of open leads.
xxZZ		The last 2 digits of the error code indicate the total number of faulty Packet Bus leads detected by the Maintenance/Test Packet Bus port. **1** Refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 7, "Packet and serial bus maintenance" in *Maintenance Procedures (555-245-103)* to determine the cause of the failures.
	PASS	No faults have been detected on the Packet Bus by the Maintenance/Test circuit pack. This indicates that the Packet Bus is operating correctly.

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Packet Circuit Pack Audit Test (#573)

This test determines whether Packet circuit packs have reported Packet Bus-related in-line errors within the last minute. If so, the failure code indicates whether one or more circuit packs have reported failures within the last minute.

Due to the one-minute time constraint included as part of this test, the test is designed to delay 15 seconds before returning a result in cases where the test has failed within the last five minutes. This procedure helps ensure that a repeated sequence of the test does not always yield the same result. If no failure has occurred in the last five minutes, a PASS is returned immediately.

Table 638: Test #573 Packet Circuit Pack Audit Test

Error Code	Test Result	Description/ Recommendation
2500	ABORT	An internal operation failed; the test could not be completed. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1	FAIL	One Packet circuit pack has reported Packet Bus-related in-line errors within the last minute.
2	FAIL	More than one Packet circuit pack has reported Packet Bus-related in-line errors within that last minute. **1** Refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 7, "Packet and serial bus maintenance" in *Maintenance Procedures (555-245-103)* to determine the cause of the error reports.
	PASS	No Packet circuit packs have reported Packet Bus-related in-line errors within the last minute. This indicates that the Packet Bus is healthy, or that a Packet Bus fault is transient or is being caused by a faulty Packet circuit pack. If this test passes while there are other signs of a Packet Bus failure (as indicated, for example, in the Error/Alarm Logs or by other test failures), refer to the "Packet Bus Fault Isolation Flowchart" section in Chapter 7, "Packet and serial bus maintenance" in *Maintenance Procedures (555-245-103)* to isolate the problem.

PKT-INT (Packet Interface)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
PKT-INT	MAJOR	**reset packet-interface *UC***	Packet Interface
PKT-INT	MINOR	**test packet-interface *UC***	Packet Interface
PKT-INT	WARNING	**test packet-interface *UC***	Packet Interface

1 For information on specifying a ***location***, see Command Syntax on page 179.

The Packet Interface (PKT-INT) MO resides on the TN2312AP IP Server Interface (IPSI) circuit pack and serves as an interface between the media server and the packet bus.

The TN1665 PKT-INT and TN2182 Tone-Clock circuit packs' functions are on the TN2312AP IPSI circuit pack. The IPSI circuit pack also provides:

- PKT-INT packet-bus interface
- Archangel TDM-bus interface
- Tone-Clock functionality
- Ethernet interface for connectivity to media servers
- Ethernet interface for connectivity to services laptop PCs
- **S8700 MC**: Maintenance board interface for communication with the PN's Maintenance board, in Carrier A or B only

The TN2312AP IPSI circuit pack is inserted into a PN's Tone-Clock slot and provides an Ethernet interface back to the media servers. The PKT-INT interface module on the IPSI is like previous DEFINITY TN1655 PKT-INT boards. However, the IPSI's PKT-INT module does not support DMI Mode-2/-3 data or BX.25 links.

The PKT-INT supports links used for call setup of every port located in a PN. Packet Interface failure prevents call set-up and tear-down from telephones and trunks connected to PNs.

In addition to affecting telephone service, Packet Interface failure affects the service provided by circuit packs that connect to the Packet bus. For example:

- TN464C, TN2207, TN2464 Universal DS1 circuit pack — ISDN-PRI service
- TN556, TN2198, TN2185 ISDN-BRI Line circuit pack — ISDN-BRI service
- **S8700 MC**: TN2305, TN2306 ATM
- **S8700 MC**: TN570 Expansion Interface (EI)
- **S8700 MC**: TN573 Switch Node Interface (SNI)
- TN799DP Control LAN (C-LAN) packet port circuit pack
- TN2501 Voice Announcements over the LAN (VAL)

S8700 MC: If the active IPSI's Packet Interface module causes a MAJOR alarm in a high- or critical-reliability system (with duplicated IPSIs), an IPSI interchange occurs if the standby IPSI's state of health (SOH) is high enough to permit the interchange. A MAJOR alarm due to a failure of the standby IPSI's Packet Interface module lowers the standby's SOH, preventing a subsequent interchange.

The links that pass through the Packet Interface are identified as application links or system links as follows:

- Application links are endpoints that require connectivity to the media server via the C-LAN board's Socket interface. These links pass over the packet bus, and through C-LAN ports. The following system features use application links:
  - Call Detail Recording (CDR)
  - Dial-up administration
  - Property Management System (PMS)
  - Journal printer
  - Wake-up log printer
  - Announcement circuit pack upload/download of recorded messages
  - IP phones
- System links
  - Expansion Archangel links (signaling links for call setup of a PN's endpoints)
  - Center Stage Control Network (CSCN) links
  - ISDN-PRI D-channel signaling links
  - ISDN-BRI D-channel broadcast and point-to-point signaling links
  - Adjunct Switch Application Interface (ASAI) links
  - Remote Socket Control Link (RSCL) (C-LAN, VAL)
  - BRI (TRK and STA)

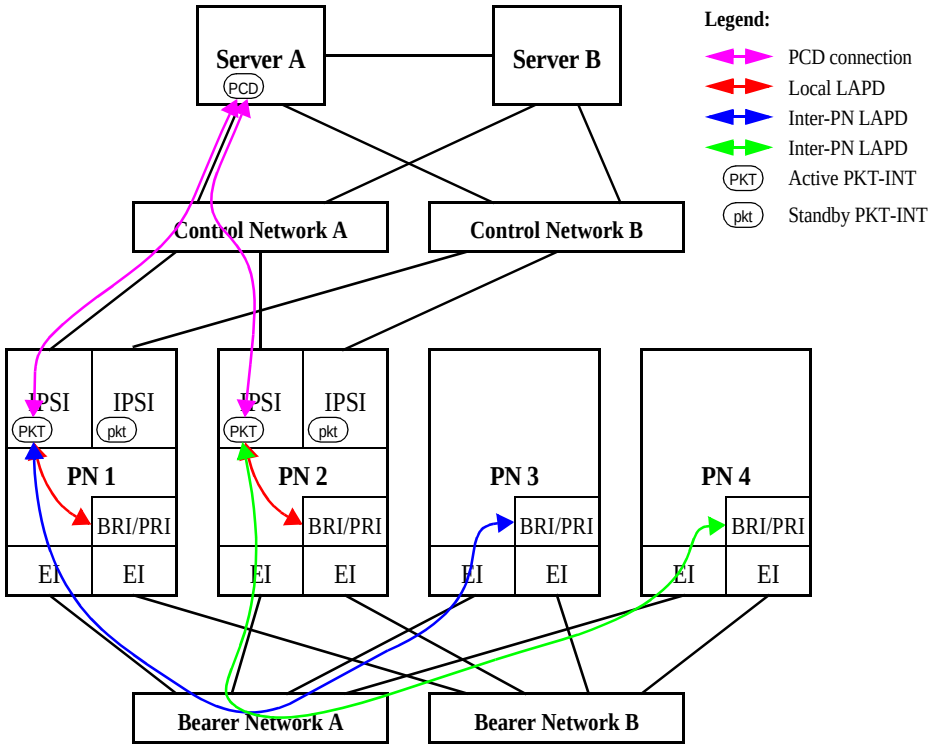
Distributed PKT-INTs

In earlier G3r systems, every PKT-INT resided in the PPN and terminated all of the LAPD links. LAPD links are now terminated by the PKT-INT modules within IPSIs that are distributed out to the PNs, or out to every PN for the S8700 IP Connect. The G3r allowed up to three active and three standby PKT-INTs in the PPN. The present systems allow one active and one standby PKT-INT in each PN:

- up to 64 active PKT-INT for ATM PNC in S8700 Multi-Connect
- up to 44 active PKT-INT for CSS PNC in S8700 Multi-Connect
- up to 64 active PKT-INT in S8700 IP Connect

S8700 MC: As shown in Figure 109, Distributed PKT-INTs, on page 1423, PNs 1 and 2 have IPSIs that terminate LAPD links. PNs 3 and 4 do not have local IPSIs, so their LAPD links are terminated by IPSIs in PNs 1 and 2.

Figure 109: Distributed PKT-INTs



S8700 MC

PKT-INT Interchange

In G3r systems, PKT-INT interchange was an integral part of an SPE interchange. In S8700 Multi-Connect, PKT-INT interchange is independent of media server interchange, and a PKT-INT interchange can occur without a media server interchange and vice versa. In S8700 Multi-Connect, the active media server's packet control driver (PCD) has sockets to both active and standby IPSIs and exchanges heartbeats with both. The active PCD is responsible for bringing up the active PKT-INT, and for bringing up the standby PKT-INT into the standby mode. This is different than the G3r, where the standby PCD brings up the standby PKT-INT into the standby mode. The standby PCD also has sockets to both active and standby IPSIs and exchanges heartbeats with both. The standby PCD only talks to the IPSI SIM, and does not communicate with the PKT-INTs. In the G3r systems, the active media server communicated with the standby media server via the SMM to perform maintenance activities on the standby PKT-INT. In S8700 Multi-Connect, the active media server communicates directly with both active and standby PKT-INTs and performs maintenance activities on both PKT-INTs without the standby media server getting involved.

Earlier G3r PKT-INT duplication relied on the duplication hardware to automatically duplicate and write each command from the processor into the active and standby PKT-INT's dual-port RAMs. The standby PKT-INT was always up-to-date with the state of every link terminated by the active PKT-INT. On S8700 Multi-Connect, there is no dedicated hardware to keep the standby PKT-INT up-to-date. Instead, the PCD refreshes the standby PKT-INT prior to an interchange.

Executing a PKT-INT Interchange

There are two ways to interchange PKT-INTs, spontaneous and planned.

- A spontaneous interchange is usually caused by a fault, and:
  - — Stable calls are retained
  - — LAPD links are restarted
  - — Some data may be lost
- A planned interchange can be requested by Services' personnel or by software for maintenance or periodic testing.
  - — LAPD links are migrated from the active to the standby PKT-INT
  - — No data is lost during the interchange

The active media server's PCD has socket connections to both active and standby IPSIs. Media server interchange and IPSI interchange are independent of each other. IPSIs in a PN can be interchanged independently of IPSIs in other PNs.

Spontaneous PKT-INT Interchange

For S8700 Multi-Connect, the standby PKT-INT is not kept up-to-date with the links terminated by the active PKT-INT. During a spontaneous interchange of PKT-INTs, the standby PKT-INT is refreshed with the link information by the active PCD and the standby PKT-INT is activated with a warm reset. As with G3r, a spontaneous interchange of PKT-INTs may result in loss of some up-stream and down-stream data.

- PCD maintains socket connections to the active and the standby PKT-INTs, via the SIM.
- Media server sends control and data packets only to the active PKT-INT.
- Standby PKT-INT has no information about the LAPD links.
- On a spontaneous interchange, the standby PKT-INT is "refreshed" by the PCD. That means the LAT and the LCT are sent to the PKT-INT, and the standby PKT-INT is made active by a warm interrupt.

Planned PKT-INT Interchange (Link Migration)

A planned interchange of PKT-INTs uses link migration to assure that no data is lost during the interchange. On a planned interchange of PKT-INTs, software initiates the link migration by sending commands to the active and standby PKT-INTs to make a peer link between the PKT-INTs and to start the link migration process. Down-stream and up-stream messages can be processed by the PKT-INTs during the link migration process. As long as the PKT-INT interchange has not been completed, PCD should continue to send down-stream messages to the active PKT-INT. If a down-stream data packet is for a link that has not yet been migrated over to the standby PKT-INT, the active PKT-INT processes it and sends it out.

If a down-stream data packet is for a link that has already migrated over to the standby PKT-INT, the peer link forwards the down-stream data packet to the standby PKT-INT, and the standby PKT-INT processes it and sends it out. Up-stream messages during migration are handled by both PKT-INTs as with the down-stream messages. The PKT-INT that controls the link (the active PKT-INT if the link has not yet been migrated, and the standby PKT-INT if the link has been migrated) processes the up-stream data packet and sends it up to the PCD. During the migration process, both the active and the standby PKT-INTs can send up-stream messages to the PCD.

On G3r, during the migration process, the standby PKT-INT terminating a link processes the up-stream packet and forwards it to the active PKT-INT, which sends it up to the PCD.

On S8700 Multi-Connect, all down-stream packets go to the active PKT-INT, but the up-stream packets can come from the active and the standby PKT-INTs during the migration process.

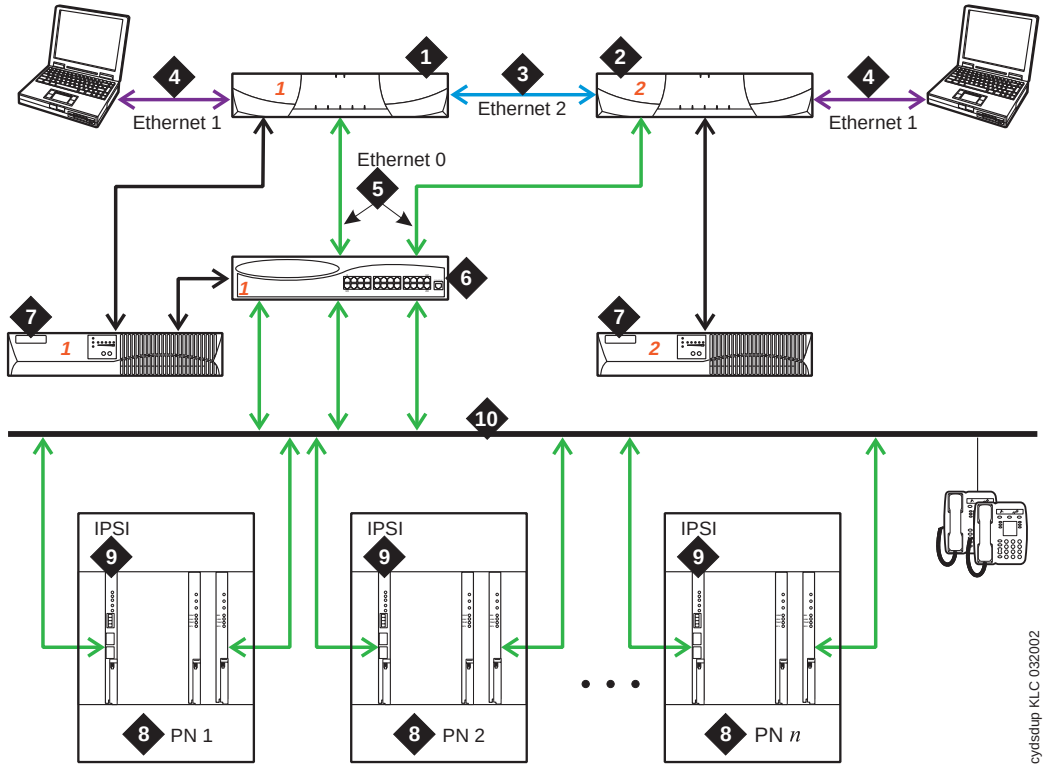
- Link migration is performed to prepare the standby PKT-INT for a hot reset.
- RNRs are not sent to the endpoints at the start of the link migration.
- PCD tells the active and standby PKT-INTs that a link migration is starting.
- LAPD links are migrated from the active-mig PKT-INT to the standby-mig PKT-INT in the order they appear in the internal list.
- Active-mig PKT-INT continues to accept up-stream messages for the links that are not yet migrated. The standby-mig PKT-INT starts accepting up-stream messages for the links that are migrated. Both the active-mig and the standby-mig PKT-INTs send up-stream messages to the PCD.
- PCD accepts up-stream messages from both the active-mig and standby-mig PKT-INTs.
- PCD sends every down-stream message to the active-mig PKT-INT and has the active-mig PKT-INT send it out for those links that have not been migrated or forward it to the standby-mig PKT-INT for those links that have been migrated.
- At the end of the migration, the active-mig PKT-INT tells the PCD that the migration is finished, and PCD tells the standby-mig PKT-INT to go active (hot interrupt). Some coordination verifies that every up- and down-stream message has been flushed from the active-mig PKT-INT before completing the interchange.

PKT-INT and System Reliability

S8700 IP

A PKT-INT module resides on each IPSI board. For increased system reliability on an S8700 IP Connect, there is a duplicated server, and one server is in active mode and one server is on standby. However, there is only one control network and one IPSI per port network as shown in Figure 110, IP Connect Duplex Reliability, on page 1426. There is only one PKT-INT per port network.

Figure 110: IP Connect Duplex Reliability



#	Description of Components and Connections
1	S8700 Media Server 1 – two are always present, one in an active mode and one on standby.
2	S8700 Media Server 2 – two are always present, one in an active mode and one on standby.
3	Duplication Interface – the Ethernet connection between the two S8700 media servers.
4	Services Interface – the S8700 media servers dedicated Ethernet connection to a laptop. This link is active only during on-site administration or maintenance, and the services interface can link to the non-active server through a Telnet session.
5	Connection from the Servers to the Ethernet switch.
6	Ethernet Switch – a device that provides for port multiplication by having more than one network segment. In an IP Connect environment, the Ethernet switch should support 802.1 ip/Q, VLAN and 10/100 mbps.
7	UPS units – two required.
8	Port Network – optional configuration of media gateways that provides increased switch capacity.
9	IPSI – provides transport of CCMS messages over IP, allowing the S8700 media server to communicate with the port networks.
10	Customer LAN

S8700 MC

On S8700 Multi-Connect, a PKT-INT module resides on each IPSI board. LAPD links are terminated by the PKT-INT modules in the IPSIs that are distributed out to the port networks. The non-IPSI-terminated port networks do not have their own PKT-INT capability, so their LAPD links are terminated by IPSIs in the IPSI-terminated port networks.

S8700 Multi-Connect architecture has three items that can be duplicated for increased reliability: media server, IPSI, and PNC. They can be duplicated independently. Duplicated control networks and duplicated IPSIs go together, so that when the IPSIs are duplicated, the control networks must be duplicated. The set of items in your configuration that are duplicated depend on the reliability option chosen for your system: duplex, high or critical. See Reliability Options.

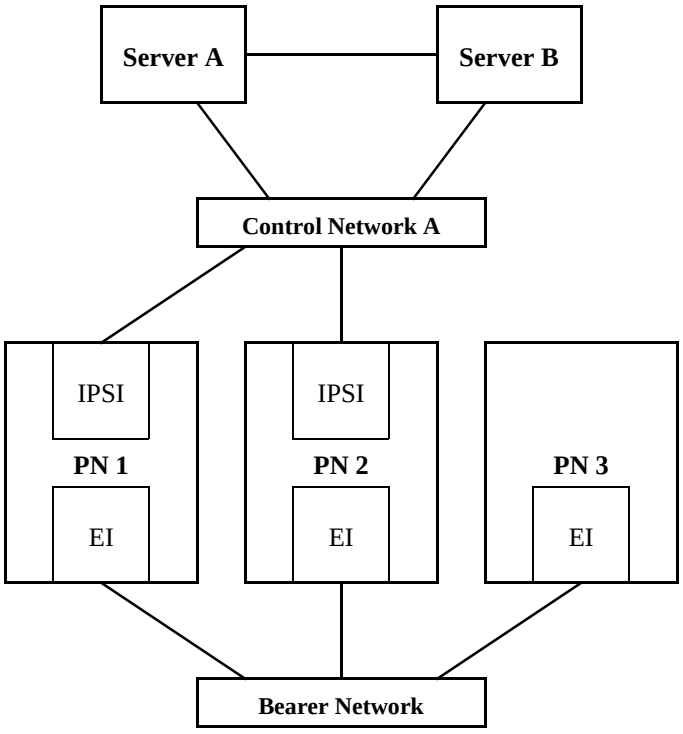
Reliability Options

Configurations	Servers	Control Networks and IPSIs	Bearer Networks
Duplex Reliability	Duplicated	Unduplicated	Unduplicated
High Reliability	Duplicated	Duplicated	Unduplicated
Critical Reliability	Duplicated	Duplicated	Duplicated

Duplex-Reliability Configuration

The duplex-reliability configuration shown in Figure 111, Duplex-Reliability Configuration, on page 1428 has duplicated media servers, an unduplicated control network, unduplicated IPSIs in the IPSI-connected PNs, and an unduplicated bearer network. Because the IPSIs are not duplicated, the PKT-INT modules contained within them are not duplicated.

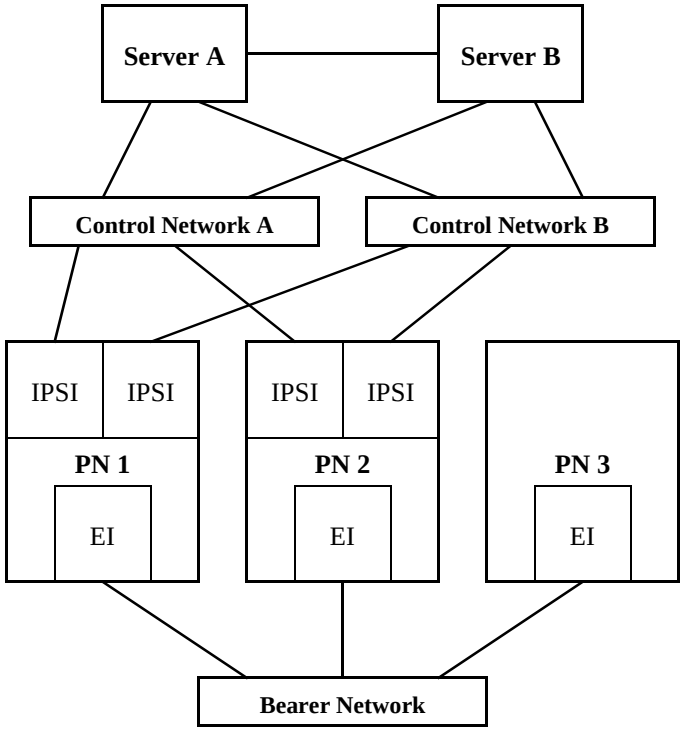
Figure 111: Duplex-Reliability Configuration



High-Reliability Configuration

The high-reliability configuration shown in Figure 112, High-Reliability Configuration, on page 1429 has duplicated media servers, duplicated control networks, and duplicated IPSIs in the IPSI-connected PNs. With this configuration, every IPSI-connected PN must have duplicated IPSIs. The duplicated control network prevents a single fault in the control network, such as a bad Ethernet switch, from bringing the whole system down. Because the IPSIs are duplicated in this configuration, the PKT-INT modules are duplicated.

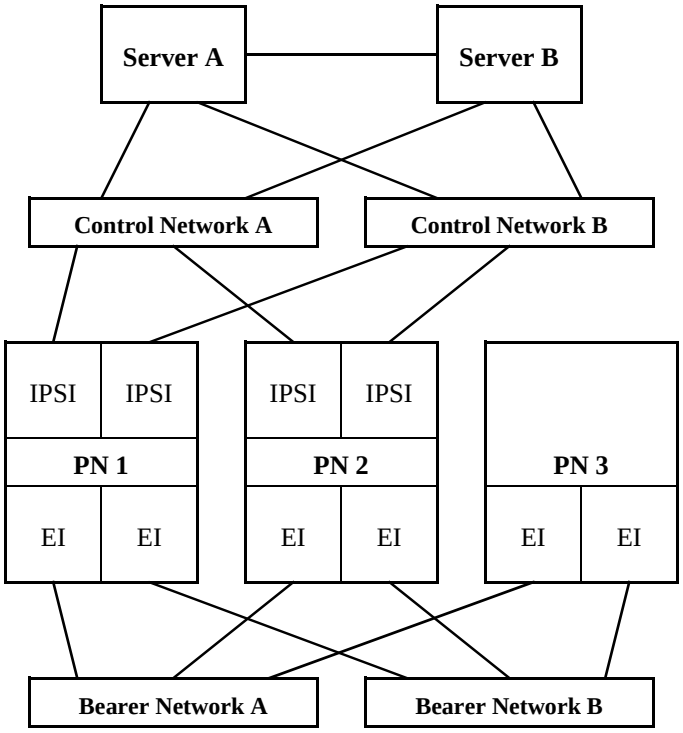
Figure 112: High-Reliability Configuration



Critical-Reliability Configuration

The critical-reliability configuration shown in Figure 113, Critical-Reliability Configuration, on page 1430 has full duplication of the following options: media servers, control networks, IPSIs and PNCs (bearer networks). As with the high-reliability configuration, this configuration requires that IPSI-connected PNs have duplicated IPSIs. Because the IPSIs are duplicated in this configuration, the PKT-INT modules are duplicated.

Figure 113: Critical-Reliability Configuration



Packet Interface Service Operations

The following sections provide more background information about service operations for the Packet Interface.

Administration

PKT-INT modules are automatically administered as a component of an IPSI circuit pack. See **add ipserver-interface**, **remove ipserver-interface**, **test packet-interface**, **status packet-interface**, and **reset packet-interface**.

Packet Interface Circuit Replacement

To replace a Packet Interface module that is part of a TN2312AP IPSI circuit pack, follow the procedure for replacing an IPSI circuit pack.

Demand Reset of a Packet Interface

System software denies a demand reset of an active IPSI's Packet Interface (**reset packet-interface**) if the Packet Interface is in service, and has not been placed in an out-of-service state by background maintenance software. A reset of an in-service Packet Interface causes severe service disruption, including the loss of all existing calls, and dropped links to adjuncts such as AUDIX. As part of the automatic recovery action initiated when a fatal hardware-fault condition is detected, the software that controls Packet Interface maintenance puts a Packet Interface module in the out-of-service state if that IPSI circuit pack has been reset three times within the last 15 minutes.

A demand reset of a standby Packet Interface is not disruptive and is allowed regardless of the service state of the associated maintenance software.

Service States

Packet Interface maintenance software maintains a state variable to monitor the service state of each Packet Interface. To determine the state of a Packet Interface, use **status packet-interface**. A Packet Interface can be in the service states:

- **in-service** - in service and active
- **standby** - in service and standby
- **out-of-service** - active or standby Packet Interface not in service
- **standby-disabled** - IPSI circuit pack with Packet Interface module is present and administered, but duplication is disabled
- **craft-busy** - Packet Interface has been demand busied out by craft
- **uninstalled** - Packet Interface is administered but not physically present

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S8700 MC

If the circuit pack's diagnostic tests do not pass in a standard- or duplex-reliability system (unduplicated IPSIs), the failing Packet Interface is placed in an out-of-service state. Every link handled by that IPSI goes down, and may be re-established using other Packet Interface resources. Calls associated with these links may drop.

If the standby IPSI (in a high- or critical-reliability system, with duplicated IPSIs) has an acceptable state of health, maintenance software interchanges the IPSIs, instead of resetting the active IPSI's Packet Interface module. This is less disruptive than a reset.

An IPSI's Packet Interface module goes out-of-service if the IPSI has been reset by background maintenance 3 times in the last 15 minutes, whether or not reset succeeded. Various errors will lead to a Packet Interface reset. See the "Error Log Entries and Test to Clear values" section.

An extensive set of diagnostic tests is run when the circuit pack is reset.

S8700 MC

Duplication Impact

The Packet Interface module is a single point of failure in a standard- or duplex-reliability system, with unduplicated IPSIs. If not acceptable, an S8700 Multi-Connect customer can upgrade to a high- or critical-reliability system with duplicated IPSIs. Figure 109, Distributed PKT-INTs, on page 1423 shows an S8700 Multi-Connect configuration with duplicated IPSIs. The following concepts apply to duplicated IPSIs:

- Packet-bus connection

  In a high- or critical-reliability system (duplicated IPSIs), the standby IPSI's Packet Interface module cannot access the packet bus to write data, except during a planned IPSI interchange or when the Peer Link test (#888) is run. The Maintenance Loop-Around test (#886), which requires access to the packet bus, is not run on the standby IPSI's Packet Interface module.

- IPSI interchange

  Severe Packet Interface module faults that cause system and application links to go down are detected within 1 second. A fatal fault error message is generated, and the Packet Interface maintenance software attempts to run the Packet Interface Reset test. In a high- or critical-reliability system, this results in a requested IPSI interchange, instead of a Packet Interface reset, since stable calls are preserved across the interchange.

Maintenance-Object Interactions

- Packet Bus maintenance

  A Packet Interface physically interacts with the PKT-BUS. It may be difficult to isolate faults to one or the other component for certain types of Packet Interface errors. In each of these cases, Packet Interface maintenance forwards an error report to packet-bus maintenance, where it records a packet-bus fault in the hardware error log and runs Packet Bus tests.

- Packet Interface maintenance

  The operation of the IPSI circuit pack's Packet Interface module affects the operation and maintenance of other circuit packs connected to the packet bus. This includes:

  1. BRI applications (BRI-PT)
  2. Universal DS1 applications (UDS1) for ISDN/PRI applications
  3. **S8700 MC**: Expansion Interface circuit pack maintenance (EXP-INTF)

  Some packet errors require examination of the Packet Interface's operating status. To obtain this information:

  - Examine the Error and Alarm Logs for PKT-INT entries and determine which PKT-INT the link is accessing.
  - Use **status sys-link** to identify the PKT-INT location in this PN, or use **status sys-link** to find the PKT-INT hardware used by the faulted link.
  - Use **test sys-link** to troubleshoot the component.
  - Use **status packet-interface** to determine the:
    - service state of the Packet Interface, for example, in service/out of service

— total number of Packet Interface links assigned to a Packet Interface.

For a standby IPSI's Packet Interface module in a high- or critical-reliability system (duplicated IPSIs), the module is shown in standby mode if it is not out-of-service because of a failure condition. The number of links for a standby Packet Interface module is always zero.

In general, if every link for an active IPSI's Packet Interface module is shown as a Failed Link, there may be a fault on either the Packet Interface module or the packet bus that caused every link to go down. If only a small percentage of the links are shown as Failed Links, then the Packet Interface is probably not the source of the problem. Some typical sources of individual link failures include:

- failed BRI telephone set
- disconnected cord to a BRI set, causes three link failures
- **S8700 MC**: failed or removed EI circuit pack in a PN, causes one link failure

For a case where not every link appears in the Failed Links category, examine the alarm and error logs for failures of the following circuit packs, and follow the repair procedures for those circuit packs before considering replacing the associated IPSI circuit pack:

- **S8700 MC**: TN570 Expansion Interface circuit pack (EXP-INTF)
- **S8700 MC**: TN573 Switch Node Interface circuit pack (SNI-BD)
- **S8700 MC**: Switch Node Clock circuit pack (SNC-BD)
- ISDN-BRI Line circuit packs, ports, and stations (BRI-BD, BRI-PORT, BRI-SET)
- Universal DS1 circuit packs and ports (UDS1-BD, TIE-DS1)
- TN464C, TN2207, TN2464 Universal DS1 circuit pack — ISDN-PRI service
- TN556, TN2198, TN2185 ISDN-BRI Line circuit pack — ISDN-BRI service
- TN2305, TN2306 ATM
- TN799DP Control LAN (C-LAN) packet port circuit pack
- TN2501 Voice Announcements over the LAN (VAL)

Use **test sys-link** with the faulted path option to test all components in the faulted link.

Error Log Entries and Test to Clear Values

Table 639: Packet Interface Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	ON	**test packet-interface** *Uc* **l r 2**
1 (a)	Any	None	MAJOR	ON	**reset packet-interface** *Uc*[2]
10 (b)	0	None			
50 (c)	0	None			
257 (d)	Any	None	MAJOR	ON	**reset packet-interface** *Uc*
513 (e)	Any	None	MAJOR	ON	**reset packet-interface** *Uc*

Table 639: Packet Interface Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
769 (f) 770 (f)	Any	Maintenance Loop-Around test (#886)	MAJOR	ON	**test packet-interface** *Uc* **s r 2**
1025 (g)	Any	Private Loop-Around test (#885)	MAJOR	ON	**reset packet-interface** *Uc*[2]
1281 (h)	Any	None	MAJOR	ON	**reset packet-interface** *Uc*[2]
1537 (i)	Any	Memory Checksum test (884)	MINOR	ON	**test packet-interface** *Uc* **l r 2**
1793 (j)	Any	Memory Checksum test (#884)	MINOR	ON	**test packet-interface** *Uc* **l r 2**
2049 (k)	Any	None	WARNING	ON	**test packet-interface** *Uc* **r 25**
2305 (l)	Any	None			**test packet-interface** *Uc* **r 2**
2561 (m)	Any	Active-Standby Peer Link test (#888)	MINOR	OFF	**test packet-interface** *Uc* **s r 2**
2817 (n)	Any	Read and Clear test (#887)	MINOR/ MAJOR	ON	**test packet-interface** *Uc* **s**
3074, 3073, 3072 (o)	Any	Maintenance Loop-Around test (#886)	WARNING	OFF	**test packet-interface** *Uc* **s r 2**
3585 (p)	Any	None	WARNING	OFF	**reset packet-interface** *Uc*[2]
3841 (q)	Any	None	MAJOR	OFF	**reset packet-interface** *Uc*[2]

2 of 2

1 Indicates that an alarm was raised but an associated error was not entered into the hardware error log due to a momentary overload condition caused by a burst of hardware or software error reports. Run the long test sequence. Refer to the test description and follow the recommended procedures.

2 A Packet Interface module on an active IPSI can only be reset if it has been taken out of service by background maintenance software. A Packet Interface module on a standby IPSI can be reset independent of its service state.

Notes:

a Error 1 occurs when background maintenance software has reset the Packet Interface module on an IPSI circuit pack as a fault recovery action. It is used to keep track of the number of times that the Packet Interface is reset, independent of whether or not the Reset test passed. When 3 of these errors occur in 15 minutes, maintenance places the Packet Interface into an out-of-service state, and a MAJOR on-board alarm is raised on the Packet Interface (PKT-INT).

1 Check to see if error codes 257, 513, 769, 1025, 1281, or 3841 are present in the hardware error log. If one or more of those error codes are present, follow the repair procedures for those errors.

2 If no other Packet Interface errors appear in the error log, and if the Packet Interface is not in a held reset state as indicated by the absence of a MAJOR alarm with a Service State of OUT, take no action. If a Packet Interface MAJOR alarm is present and no other Packet Interface error codes are in the hardware error log, use **reset packet-interface *Uc*** to execute a demand reset, and refer to the repair procedures for Test #889.

b Error 10 indicates that the Packet Interface maintenance software caused an escalating system WARM restart as part of a recovery action for certain Packet Interface failures. A SYSTEM error type 10 should also be present, indicating that a software-initiated WARM restart occurred.

1 Check to see if error types 513, 1025, or 3074 are present in the hardware error log. If any are present, follow the repair procedures for those errors.

c Error 50 indicates that the media server is sending more downlink messages than the Packet Interface module can process. This is an in-line error not produced by any test. When this error is reported, application software is slowed down to allow the module to process existing downlink messages. If there is a hardware problem, the Packet Interface test causes other errors to be logged. In rare cases when no other PKT-INT errors are logged but error 50 occurs more than 10 times in the last hour, follow normal escalation procedures.

d Error 257 indicates that the Packet Interface module on the IPSI circuit pack detected a fatal failure. This error is a very serious. When it occurs, maintenance software immediately escalates testing to the Destructive Reset test (#889).

1 If the Packet Interface module has a MAJOR alarm:

a Use **reset packet-interface *Uc*** to reset the Packet Interface.

b Refer to the repair procedures for the Packet Interface Reset test (#889).

2 If the Packet Interface is not alarmed, take no action.

e Error 513 is called Message Handshake failure. It indicates that a failure with the message protocol between the media server's software and the Packet Interface was detected.

1 If the Packet Interface has a MAJOR alarm:

a Use **reset packet-interface *Uc*** to reset the Packet Interface.

b Refer to the repair procedures for the Packet Interface Reset test (#889).

2 If the Packet Interface is not alarmed, take no action.

f Error 769 and 770 indicate that there was a failure in the Packet Loop-Around test. A maintenance loop-around link cannot be established or the Packet Interface cannot send and receive data correctly as part of the Loop-Around test (#886). If the number of errors exceeds a defined threshold, a Major alarm is raised.

In a high- or critical-reliability system (duplicated IPSIs), a failure of the Maintenance Loop-Around test may have caused an IPSI interchange. This results in an alarm associated with error code 769 or 770 being reported against the standby IPSI's Packet Interface module.

Test 886 can be run only on the active IPSI. Use **busy ipserver-interface** followed by **release ipserver-interface** to clear the error on the standby IPSI. Then use **set ipserver-interface** to force an IPSI interchange.

For more information, refer to the repair procedures of Test #886.

g Error 1025 indicates a failure of the Private Loop-around test (#885).

1 If the Packet Interface has a MAJOR alarm:

a Use **reset packet-interface *Uc*** to reset the Packet Interface.

b Refer to the repair procedures for the Packet Interface Reset test (#889).

2 If the Packet Interface is not alarmed, take no action.

h Error 1281 indicates that the Packet Interface has Translation RAM failures. PKT-INT Translation RAM is used to convert the addresses of a packet to the destination endpoint address.

1 If the Packet Interface has a MAJOR alarm:

a Use **reset packet-interface *Uc*** to reset the Packet Interface.

b Refer to the repair procedures for the Packet Interface Reset test (#889).

2 If the Packet Interface is not alarmed, take no action.

i Error 1537 indicates a Boot PROM memory failure. The Packet Interface module may still be operational if no other errors are reported. However, the module may report a fatal fault during board initialization. This may occur during a system recovery level more severe than a WARM restart. For more information, refer to Test #884.

j Error 1793 indicates a FLASH Memory test failure. The Packet Interface module may still be operational if no other errors are reported. However, the module may report a fatal fault during board initialization. This may occur during a system recovery level more severe than a WARM restart. For more information, refer to the repair procedures of Test #884.

k Error 2049 indicates a LAPD Received Buffer Overflow error. The Packet Interface‘s packet-bus receive buffer overflowed. For more information, refer to the repair procedures of Test #887.

l Error 2305 indicates a parity failure detected by the packet-bus interface. The Packet Interface received packets with parity errors from the packet bus.

1 Check for errors logged against the packet bus and Maintenance/ Test circuit pack. Refer to repair procedures to clear those errors first.

2 Check every other circuit pack connected to the packet bus in the same cabinet. Packet-bus failures may be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane.

3 If steps 1 and 2 above do not clear the problem, use **test packet-interface**, and follow repair procedures described for Test #887.

m Error 2561 indicates a Active-Standby Peer Link test failure indicating a possible failure of the:

- Active IPSI’s Packet Interface
- Standby IPSI’s Packet Interface

If the number of errors exceeds a defined threshold, a Minor alarm is raised. For more information, refer to the repair procedures of Test #888.

n Error 2817 indicates a Standby Packet Interface Translation RAM failure. A MINOR alarm is raised when there are 1 to 5 bad locations and a MAJOR alarm is raised when there are 5 or more bad locations. Use **test packet-interface**, and follow repair procedures described for Test #887.

o Errors 3074, 3073, and 3072 indicate PKT-INT Transmit Buffer Overflow, which means that the number of transmit buffers required by software exceeded the number available. A 3074 error is generated when the PKINT sends an in-line hardware error to maintenance software, indicating transmit buffer overflow. As part of the background recovery action for this error, maintenance software automatically runs the Maintenance Loop-Around test (#886). If that test fails, maintenance software generates error codes 3073 and 3072, and it requests a system WARM restart. If, after the WARM restart, transmit buffer overflow errors continue to be reported, maintenance software generates error code 100 and it resets the PKT-INT. These errors may be the result of system overload due to a problem with communication between the PKT-INT and the PNs.

1. Check for errors logged against the Expansion Interface circuit pack, the Switch Node Interface circuit pack, Packet Gateway circuit pack, the Packet Data Line circuit packs associated with the System Ports, BRI Line circuit packs and BRI endpoints, and the Universal DS1 circuit packs supporting PRI service. Clear errors against those components first.
2. Use **test packet-interface short** against the Packet Interface associated with the error. If the Maintenance Loop-Around test (#886) passes, the alarm will clear. If the test fails, repeat the test 5 times. If it continues to fail, follow normal escalation procedures.

p Error 3585 indicates that a packet-bus failure has been detected and that the packet bus is alarmed. Refer to the packet bus maintenance documentation for further action.

q Error 3841 indicates that the Packet Interface has reported a fatal fault failure condition that may be caused by a packet-bus fault on the PN containing the failed PKT-INT.

1. If error 3585 has also been reported, see PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414. After the packet-bus fault has been corrected, use **reset packet-interface** to bring the Packet Interface back into service.
2. If error 3585 has not been reported, use **reset packet-interface**, and follow the repair steps associated with Test #889.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the Packet Interface Private Loop-Around test, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ ND[1]
Packet Interface Reset test (#889)			X	D
Packet Interface Private Loop-Around tests (#885)		X		ND
Packet Interface Maintenance Loop- Around test (#886) Runs on an active IPSI circuit pack's Packet Interface module	X	X		ND
Packet Interface Memory Checksum test (#884)		X		ND
Packet Interface Error Counter Read and Clear test(#887)	X	X		ND
Packet Interface Active-Standby Peer Link test (#888) Runs on a standby IPSI circuit pack's Packet Interface module	X	X		ND

1 D = Destructive; ND = Nondestructive

Memory Checksum Test (#884)

This test involves sending a message to the Packet Interface module to run private nondestructive memory checksum tests on the firmware text residing in Boot PROM and FLASH memory on the IPSI circuit pack. If the test fails during background testing, the Packet Interface module remains operational

until an executed reset. Then, the initialization firmware fails and puts the Packet Interface in an out-of-service state.

Table 640: Test #884 Memory Checksum Test

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	Because the IPSI's Packet Interface module is out of service, normal maintenance tests do not run on the Packet Interface. **1** Use **reset packet-interface *Uc*** to reset the Packet Interface. For further action, see the repair procedures in Table 645, Test #889 Reset Test, on page 1451 for the Packet Interface Reset test (#889).
1334	ABORT	The Packet Interface command queue is full. This should be a temporary condition caused by a high rate of commands being sent to a Packet Interface. Continued operation with a full command queue causes a system WARM restart that may escalate to more severe restart levels. **1** Retry the command at 10-second intervals up to 5 times.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, so this test is not allowed to execute. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned, but is not detected as being physically present. **1** If the IPSI circuit pack is present, replace it. **2** If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and run the test again.

Table 640: Test #884 Memory Checksum Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The Boot PROM memory checksum test failed. The circuit pack may still be operational. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** The same error code occurs: **a** If this is a standard- or duplex-reliability system, replace the circuit pack at a time that would cause the least disruption of service. The circuit pack is still functional but should be replaced since it may not operate after a system reboot and it will enter a fatal fault state if it is reset for other reasons. **b** If the Packet Interface module is on the standby IPSI (**S8700 MC**: and this is a high- or critical-reliability system), replace that circuit pack. **c** If the Packet Interface module is on the active IPSI (**S8700 MC**: and this is a high- or critical-reliability system), use **set ipserver-interface** to perform a planned IPSI interchange.

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Table 640: Test #884 Memory Checksum Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The Flash memory checksum test failed. The circuit pack may still be operational, but will fail if a reset is executed. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs: **a** If this is a standard- or duplex-reliability system, replace the circuit pack at a time that would cause the least disruption of service. The circuit pack is still functional but should be replaced since it may not operate after a system reboot and it will enter a fatal fault state if it is reset for other reasons. **b** If the Packet Interface module is on the standby IPSI (**S8700 MC**: and this is a high- or critical-reliability system), replace that circuit pack. **c** If the Packet Interface module is on the active IPSI (**S8700 MC**: and this is a high- or critical-reliability system), use **set ipserver-interface** to perform a planned IPSI interchange.
3	FAIL	The Boot PROM memory Checksum test and the Flash memory checksum test have both failed. Follow the steps listed for FAIL Error Codes 1 and 2.
	PASS	The circuit pack's firmware is in a proper state. If problems are still reported on the circuit pack, check for errors on the Private Loop-around test (#885) and Maintenance Loop-Around test (#886).

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Private Loop-around Tests (#885)

This test requests the Packet Interface to execute its two private loop-around tests: Level-2 Loop Around, and Broadcast Path Loop Around. These tests verify the health of the circuit pack's packet-bus interface, as well as the translation RAM, inward and outward bound data paths, parity indications and CRC calculations.

- Level-2 (LAPD) Link Loop Around

  LAPD is a link-level protocol that is used for all system links. This test verifies the health of the processing of these links.

- Broadcast Link Loop Around

  Each ISDN-BRI port has two associated broadcast signaling links, one for call control, and one for maintenance and management. Since these links have separate routing circuitry from the Level-2 Loop Around, this test forces a CRC error to verify the CRC hardware associated with the broadcast data path.

These tests are also run as part of the reset tests. If the Level-2 Loop-Around test fails as background tests, a fatal-error message is sent to the Packet Interface modules's maintenance software, and the Packet Interface is put in the out-of-service state. Repair procedures associated with Abort Code 1137 (out of service) normally follow failures of the level-2 test.

Table 641: Test #885 Private Loop-Around Tests

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	Packet Interface module is out of service, so normal maintenance tests do not run on the Packet Interface. **1** Use **reset packet-interface *Uc*** to reset the Packet Interface circuit. For further action, see the procedures in Table 645, Test #889 Reset Test, on page 1451 for the Packet Interface Reset test (#889).
1334	ABORT	The Packet Interface modules's command queue is full. This condition should be temporary, caused by a high rate of commands being sent to a Packet Interface. Continued operation with a full command queue causes a system WARM restart that may escalate to more severe restart levels. **1** Retry the command at 10-second intervals up to 5 times.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, so this test is not allowed to execute. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned, but is not detected as physically present. **1** If the IPSI circuit pack is present, replace it. **2** If an IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.

Table 641: Test #885 Private Loop-Around Tests

Error Code	Test Result	Description / Recommendation
1	FAIL	The Private Link Broadcast Loop-Around test failed. The Packet Interface module on the IPSI circuit pack enters a fatal-fault state when this occurs, and the Packet Interface maintenance software should put the Packet Interface in a out-of-service state. By the time action is taken, the test should abort with ABORT code 1137, and a demand reset should be used to test the Packet Interface. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, use **reset packet-interface *Uc*** to reset the Packet Interface. For further action, see the repair procedures in Table 645, Test #889 Reset Test, on page 1451 for the Packet Interface Reset test (#889). **5** If the test continues to fail, replace the IPSI circuit pack.
2	FAIL	The Private Level-2 Loop-Around test failed. When this occurs, the Packet Interface module on the IPSI Circuit pack enters a fatal-fault state, and the Packet Interface maintenance software should put the Packet Interface out of service. By the time action is taken, the test should abort with ABORT code 1137, and a demand reset should be used to test the Packet Interface. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, enter **reset packet-interface *Uc*** to reset the Packet Interface. For further action, see the repair procedures in Table 645, Test #889 Reset Test, on page 1451 for the Packet Interface Reset test (#889). **5** If the test continues to fail, replace the IPSI circuit pack.

Table 641: Test #885 Private Loop-Around Tests

Error Code	Test Result	Description / Recommendation
	PASS	Every private loop-around test passed. The Packet Interface on the IPSI circuit pack is functioning properly. If the system is still unable to place calls, then: **1** Use **display errors** to display the error log, and check for errors on the packet bus and Maintenance/Test circuit pack. Clear those errors first. **2** Check all other circuit packs connected to the packet bus in the same cabinet. Packet-bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane. See PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 for repair procedures.

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Maintenance Loop-Around Test (#886)

This test checks whether an IPSI circuit pack's Packet Interface module correctly sends and receives data. It establishes a LAPD link from the IPSI's Packet Interface module back to the same Packet Interface module, and transmits and receives test data over that testing link. While timing signals from the packet bus are used for the data transfer, the data itself is looped around on the circuit pack at the interface to the packet bus and does not get sent over the packet bus.

NOTE:
In a high- or critical-reliability system (duplicated IPSIs), this test does not run on a standby IPSI's Packet Interface module. However, a failure of the Maintenance Loop-Around test may cause an IPSI interchange that reports an alarm (associated with the loop-around failure, error code 769) against the standby IPSI's Packet Interface module. If so, and if every other Packet Interface test in **test packet-interface *Uc* long** sequence passes, use **set ipserver-interface** to force the standby IPSI to go active. Then, use **test packet-interface *Uc*** to run the Maintenance Loop-Around test, and verify that the problem cleared.

Table 642: Test #886 Maintenance Loop-Around Test

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	Because the IPSI circuit pack's Packet Interface module is out of service, normal maintenance tests do not run on that Packet Interface. **1** Use **reset packet-interface *Uc*** to reset the Packet Interface. For further action, see the repair procedures in Table 645, Test #889 Reset Test, on page 1451 for the Packet Interface Reset test (#889).
1139	ABORT	The packet bus is alarmed. **1** Try to retire the alarm associated with the packet bus. Use **display alarms** to see the Alarm Log. Refer to the maintenance documentation for Packet Bus maintenance for further action. **2** Retry the command when the alarm associated with the packet bus is retired.
1335	ABORT	Internal IPSI error. Because the Packet Interface module is on the standby IPSI, this test is not allowed to execute. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
1373	ABORT	Could not establish the link loop around link to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2060	ABORT	Packet link's bus went down during maintenance loop-around test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If there are errors associated with the packet bus, see 'PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned but is not detected as being physically present. **1** If the IPSI circuit pack is present, replace it. **2** If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.

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Table 642: Test #886 Maintenance Loop-Around Test

Error Code	Test Result	Description / Recommendation
1–5	FAIL	The test failed. Either maintenance could not establish a loop-around link from the IPSI's Packet Interface module back to itself, or it could not receive data that was sent on one side of the loop-around link. **1** For Error Codes 1-4, this may be the result of old firmware not supporting new software operation. Error Code 5 means that old firmware does not support new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, use **test packet-interface *Uc*** to retry the test. If the same error code is observed, background maintenance software automatically attempts to reset the Packet Interface and clear the problem. **5** Retry the command and if the test fails, replace the IPSI circuit pack with the failing Packet Interface.
1–5 (cont'd)	FAIL	**6** If the test continues to fail after replacing the IPSI circuit pack, use **test packet *P* long**. If any of the tests fail, the fault may be on the packet bus. See PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 for recommended repair procedures. **7** If the test continues to fail after the IPSI circuit pack is replaced, and with no other alarms associated with the packet bus or circuit packs connected to the packet bus, follow normal escalation procedures.
	PASS	This test passed. The Packet Interface module on the IPSI circuit pack and its interface are functioning properly. If the system is unable to place calls on PNs served by this IPSI, then: **1** Check for packet-bus errors, and solve those errors first. **2** Check for errors in the PN where calls cannot be completed, and solve those errors. **3** Check every other circuit pack connected to the packet bus in the same cabinet. Packet-bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane. **4** Check the IPSI circuit pack's Packet Interface module that serves this PN for errors, and resolve these errors. **5** If errors continue, escalate.

Read and Clear Board Counters (#887)

This test involves sending commands to read Packet Interface error counters located on the IPSI circuit pack. It also verifies the message interface between the media server and the Packet Interface.

This test checks different Packet Interface counters (**S8700 MC**: depending on whether the Packet Interface module is on the active or standby IPSI).

Running this test on the active IPSI circuit pack's Packet Interface module reads and clears the Parity Error counter and FIFO Overflow counter. **S8700 MC**: Those counters are not used when a Packet Interface module is in standby mode.

S8700 MC: Running this test on the standby IPSI circuit pack's Packet Interface module, reads but does not clear a Translation RAM counter. The Translation RAM counter is not cleared since the number of bad translation RAM locations indicates bad locations that cannot be used.

For an active Packet Interface module, information about the number of bad Translation locations is sent to maintenance software as an in-line error from the IPSI circuit pack, so it is not necessary to read a counter location.

Table 643: Test #887 Read and Clear Board Counters

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	The IPSI circuit pack's Packet Interface module is out of service, so normal maintenance tests do not run on this Packet Interface. **1** Use **reset packet-interface *Uc*** to reset the Packet Interface. For repair procedures, see Table 645, Test #889 Reset Test, on page 1451, the Packet Interface Reset test.
1335	ABORT	Internal IPSI error. The test is on standby IPSI's Packet Interface module, so this test is not allowed to execute. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The IPSI circuit pack's Packet Interface module is administered, but is not detected as physically present. **1** If the IPSI circuit pack is present, replace it. **2** If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the administered slot, and rerun the test.

Table 643: Test #887 Read and Clear Board Counters

Error Code	Test Result	Description / Recommendation
256 512 768	FAIL	The active IPSI circuit pack's Packet Interface module has an error counter set. The following error codes are possible: 256 (parity error), 512 (FIFO overflow), 768 (parity error and FIFO overflow error). **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, and error code 256 or 768 is reported, the IPSI's Packet Interface module received a parity error off the packet bus. **a** Check for alarms logged against the packet bus. See PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 to clear those errors first. **b** Check for alarms and errors logged against other circuit packs connected to the PN's packet bus. A list of packet circuit packs is presented in the first section of this repair procedure. Refer to the repair procedures for those circuit packs, in this manual, to clear those errors first. **c** **S8700 MC**: If this is a standard- or duplex-reliability system, replace the IPSI circuit pack at a time that would cause the least disruption of service. The circuit pack is still functional but should be replaced. **d** If this is a high-reliability (**S8700 MC**: or critical-reliability) system and if the Packet Interface module is on the standby IPSI. Replace the standby IPSI circuit pack. **e** If this is a high-reliability (**S8700 MC**: or critical-reliability) system and if the Packet Interface module is on the active IPSI, use **set ipserver-interface** to perform a planned IPSI interchange. Replace the standby IPSI circuit pack.

Table 643: Test #887 Read and Clear Board Counters

Error Code	Test Result	Description / Recommendation
256 512 768 (cont'd)	FAIL (cont'd)	**5** If error code 512 or 768 is reported for an active IPSI's Packet Interface module, the receive FIFO in the PKT-INT has overflowed. This may indicate the need for additional IPSI circuit packs. For the current hardware configuration, only one IPSI circuit pack is allowed per PN. Escalate the problem if not corrected by the following repair steps. Retry the command after one minute if the test continues to fail. **a** If the Packet Interface module is on the active IPSI (**S8700 MC**: and this is a high- or critical-reliability system), use **set ipserver-interface** to perform a planned IPSI interchange. Replace the standby IPSI circuit pack. **b** Otherwise, replace the IPSI circuit pack at a time that would cause the least service disruption. **6** If error code 512 or 768 is reported for a standby IPSI's Packet Interface module, replace the standby IPSI circuit pack.
1024–1096	FAIL	**1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs: The standby IPSI's Packet Interface module has bad Translation RAM locations. A MINOR alarm is generated when the number of bad locations is from 1 and 4. A MAJOR alarm is generated if the number of bad locations is 5 or more. The MAJOR alarm prevents a planned IPSI interchange. A planned interchange may be administered to occur automatically every 24 hours, or it may be requested with **set ipserver-interface *Uc***. **1** If a MAJOR alarm is associated with this error, replace the alarmed standby IPSI circuit pack. **2** If a MINOR alarm is associated with this error, replace the alarmed standby IPSI circuit pack at a time that would cause the least disruption to service.
	PASS	The media server can communicate with the IPSI circuit pack's Packet Interface module. **1** If problems are still reported on the Packet Interface, check for failures using the Private Loop-around test (#885) and Maintenance Loop-around test (#886).

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S8700 MC

Active-Standby Peer Link Test (#888)

The Active-Standby Peer Link test is run only in a system equipped with the high- or critical-reliability configuration. It verifies that a peer link can be set up between the active and standby PKT-INTs. A peer link is a logical connection established between the packet bus and an IPSI circuit pack's Packet Interface module for both active and standby IPSIs. This link forwards data and control messages between the active and standby PKT-INT to prepare for a planned IPSI interchange. This test checks the operation of setting up a Peer Link, and verifies that the active and standby IPSI's Packet Interface modules can communicate over the packet bus.

This test checks the functionality of both the active and standby Packet Interface modules, but it is run against the standby Packet Interface module.

Table 644: Test #888 Active-Standby Peer Link Test

Error Code	Test Result	Description / Recommendation
1006 1137	ABORT	An IPSI circuit pack's Packet Interface module is out of service, so normal maintenance tests do not run on this Packet Interface. **1** Use **reset packet-interface *Uc*** to request a Packet Interface module reset. For further action, see repair procedures in Table 645, Test #889 Reset Test, on page 1451, Packet Interface Reset test.
1139	ABORT	The packet bus is alarmed. **1** Use **display alarms** to refer to the Alarm log and try to retire the alarm associated with the packet bus. For further action, see PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414. **2** Retry the command when the alarm associated with the packet bus is retired.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, so this test is not allowed to execute. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
1336	ABORT	Internal system error. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
1337	ABORT	The test is not allowed to run because a PNC interchange is in progress. A PNC interchange may have been initiated with **reset pnc interchange**, or as part of a recovery action. **1** Wait 3 minutes and retry the command.

Table 644: Test #888 Active-Standby Peer Link Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned, but is not detected as physically present. **1** If the IPSI circuit pack is present, replace it. **2** If the IPSI circuit pack is not present, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.
1	FAIL	Setting up peer links between the active and standby IPSI circuit pack's Packet Interface modules failed. The standby IPSI circuit pack's Packet Interface module did not respond to the peer link setup. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, use **display alarms** to display active alarms. **5** If errors related to the packet bus exist, see PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 and clear those problems first. **6** Retry the test command after a 1-minute delay. **7** If the test continues to fail, replace the standby IPSI circuit pack.
2	FAIL	Setting up peer links between the active and standby IPSI circuit pack's Packet Interface modules failed. The active IPSI circuit pack's Packet Interface module did not respond to the peer link setup. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, retry the test command after a one minute delay. **5** If the test continues to fail, replace the IPSI circuit pack.

Table 644: Test #888 Active-Standby Peer Link Test

Error Code	Test Result	Description / Recommendation
	PASS	The media server can communicate with the IPSI circuit pack's Packet Interface module. **1** If problems are still reported on the Packet Interface, check for failures using the Private Loop-around test (#885) and Maintenance Loop-around test (#886).

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Reset Test (#889)

The reset action initializes the Packet Interface firmware on the IPSI circuit pack and runs a comprehensive set of diagnostic tests.

The demand-reset action aborts if the specified IPSI circuit pack's Packet Interface module is in the active in-service state.

An IPSI circuit pack's Packet Interface module is put in the out-of-service state automatically if it resets 3 times by background maintenance within the last 15 minutes, independent of the results of the reset action.

If the Packet Interface module is on the standby IPSI (**S8700 MC**: and this is a high- or critical-reliability system), the demand reset action runs, independent of the service state.

Table 645: Test #889 Reset Test

Error Code	Test Result	Description / Recommendation
1334	ABORT	The Packet Interface modules's command queue is full. This should be a temporary condition caused by a high rate of commands being sent to a Packet Interface module. Continued operation with a full command queue causes a system WARM restart that could escalate to more severe restart levels. **1** Retry the command at 10 second intervals up to 5 times.
1335	ABORT	Internal IPSI error. The Packet Interface module is on the standby IPSI, and this test is not allowed to execute. **1** Use **set ipserver-interface *Uc*** to make the standby Packet Interface active. **2** Run the test.
1362	ABORT	The Reset test is not allowed to run because the Packet Interface is in service. Resetting an active IPSI circuit pack's Packet Interface module while in service is not allowed because this is a destructive test. **1** Use **status packet-interface** to determine the service state of the Packet Interface. If the Packet Interface is out of service, try the Reset command again.

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Table 645: Test #889 Reset Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The IPSI circuit pack's Packet Interface module is assigned but is not detected as physically present. **1** If the IPSI circuit pack is present, replace it. **2** If not, insert a TN2312AP IPSI circuit pack in the assigned slot, and rerun the test.
5001	ABORT	The TDM clock in the Processor port network has failed. **1** See TDM-CLK (TDM Bus Clock) on page 1847 to clear this failure.
5002	ABORT	The packet bus in the Processor port network has failed. **1** See PKT-BUS (Packet Bus) on page 1406 or PKT-BUS (Packet Bus - S8100) on page 1414 to clear this failure.
Any	FAIL	The diagnostic tests failed for the IPSI's Packet Interface module failed. If the system is equipped with the high-reliability or critical-reliability configuration on an S8700 Multi-Connect, or on an S8700 IP Connect, the reset runs only on demand if the Packet Interface is on the standby IPSI circuit pack, or if Packet Interface is in an out-of-service state on the active IPSI. **1** This may be the result of old firmware not supporting new software operation. Verify the IPSI circuit pack's firmware vintage and download the new firmware if appropriate. **2** The firmware image on the IPSI circuit pack may have been corrupted. Download the firmware image. **3** Retry the command. **4** If the same error code occurs, retry **reset packet-interface**. **5** If the reset fails, replace the IPSI circuit pack.
	PASS	The IPSI's Packet Interface diagnostic software passed. The Packet Interface is put back into service automatically.

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PKT-INT (Packet Interface - S8100)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PKT-INT	MAJOR	**reset packet-interface [1a l or 1a2]**	Packet Interface
PKT-INT	MINOR	**test packet-interface [1a l or 1a2]**	Packet Interface
PKT-INT	WARNING	**test packet-interface [1a l or 1a2]**	Packet Interface

PKT-INT on the TN2314 is implemented as a task-based module on the MPC860. The PKT-INT firmware module shares the processor with many other firmware modules.

The packet interface (PKT-INT) connected to the TDM bus provides the PRI interface to the SPE (Switch Processing Element) over the TDM bus. The PKT-INT connected to the packet bus provides the PRI interface and the TCP/IP interface from the C-LAN (TN799) to the SPE over the packet bus

The Packet Interface (PKT-INT) provides PRI link through the TDM bus. In addition to affecting telephone service, a failure of the Packet Interface affects service provided by the following circuit pack that connects to the TDM bus:

- TN767 — ISDN PRI service

The links that pass through the Packet Interface are identified as system links, and are defined as follows:

- ISDN PRI D channel signaling links
- ISDN BRI D channel broadcast and point-to-point signaling links

Packet Interface Service Operations

The following sections provides more background information about Packet Interface service operations.

Administration

There are no **add** or **remove** commands associated with the Packet Interface. The Packet Interface is always present in the system, even if no ISDN application is administered.

Packet Interface Replacement

When replacing the Packet Interface (as a part of the TN2314 Processor circuit pack), follow the procedure used for replacing the TN2314 Processor circuit pack. The carrier must be powered down before the TN2314 is removed and then the carrier must be powered back up after the circuit pack is inserted.

WARNING:

When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of

Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146).

CAUTION:

Replacing the TN 795 processor board can display the translation error message, “TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available.

Error Log Entries and Test to Clear Values

Table 646: Packet Interface Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	ON	test packet-interface [1a1 or 1a2] l r 2
1(a)	Any	None	MAJOR	ON	
257 (b)		None			
513 (c)	0	None	MAJOR	OFF	
769 (d)	0	None			
1281(e)	0	Test #1356 Restart Failure	MAJOR	ON	
2305 (f)	0	None	WARNING	OFF	
3074 (g)	Any	None	MAJOR	ON	
3585 (h)	0	None	WARNING	OFF	
3841 (i)	Any	None	MAJOR	ON	

1 Indicates that an alarm was raised but an associated error was not entered into the hardware error log due to a momentary overload condition caused by a burst of hardware or software error reports. Run the long test sequence. Refer to the appropriate test descriptions for any failures and follow the recommended procedures.

Notes:

a Error Type:1 - This error occurs when background maintenance software has reset the Packet Interface as a fault recovery action. It is used to keep track of the number of times that the Packet Interface is reset, independent of whether or not the Reset test passed. Once three of these errors have occurred in the last 15 minutes, maintenance will place the Packet Interface into an out-of-service state, and a MAJOR on-board alarm will be raised on the Packet Interface.

1 Check to see if error codes 257, 513, 769, 1281, or 3841 are present in the hardware error log. If one or more of those error codes are present, refer to the information associated with those errors for the appropriate repair procedures.

2 If no other Packet Interface errors appear in the error log, and if the Packet Interface is not in a held reset state as indicated by the absence of a MAJOR alarm with a Service State of OUT, no action should be taken. If a Packet Interface MAJOR alarm is present and no other Packet Interface error codes are in the hardware error log, execute a demand reset by entering **reset packet-interface**.

b Error Type: 257 - Indicates that the PKT-INT detected a fatal failure. This error is a very serious and when it occurs, maintenance software immediately escalates testing to the destructive reset test (#882).

A fatal fault in-line error can be generated by the following failure conditions:

1 In-line errors from PKT-INT firmware

- Failure of the initialization tests during board reset
- Failure of the Private LAPD or Broadcast Looparound Tests
- When a LANHO critical error or LANHO over-length packet error occurs
- When the values in the Configuration Control Area (CCA) are unacceptable
- When PKT-INT does not have enough memory to allocate the buffers and tables required by the CCA.

2 In-line errors from the Packet Control Driver (PCD) software

- When the PCD does not agree with the state of the PKT-INT
- Failure of the Sanity Handshake Test
- When the PCD times out waiting for the PKT-INT to come into service during initialization

c Error Type: 513 - This error type indicates that a message protocol error (Handshake failure) between Packet Control Driver (PCD) and the Packet Interface was detected. These software/firmware modules are running on the MPC860 processor (part of the TN2314 processor circuit pack).

1 If the Packet Interface (PKT-INT) has a MAJOR alarm:

Reset the Packet Interface using the reset **packet-int** command

2 If the test still fails, follow normal escalation procedures.

d Error 769 indicates that the maintenance-loop-around test failed. A maintenance loop around cannot be established or the packet interface circuit cannot send and receive data correctly as part of loop-around-test 886. If the number of errors exceeds a defined threshold, a major alarm will be raised. For more information, refer to the repair procedures for test 886. If handshake is up, execute a test long clear of the alarmed circuit pack and follow recommended procedures.

e Error Type: 1281 - This error type indicates that the Packet Interface has been restarted as a result of a fault recovery action. This action occurred due to error type 1 occurring three times within 15 minutes. As a result of this action the PKT-INT will be taken out of service.

f Error Type: 2305 - This error indicates that the Packet Bus Interface received packets with parity error from the Packet bus.

1 Check for errors logged against the Packet bus. Refer to the appropriate repair procedures to clear those errors first.

2 Check all other circuit packs connected to the Packet bus in the same cabinet. Packet Bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane.

3 If steps 1 and 2 above do not clear the problem, execute the **test packet-interface** command and follow repair procedures described for Test #887.

g Error Type: 3074 - indicates PKT-INT Transmit Buffer Overflow, which means that the number of transmit buffers required by software exceeded the number available. A 3074 error is generated when the PKINT sends an in-line hardware error to maintenance software indicating transmit buffer overflow. As part of the background recovery action for this error, maintenance software

will automatically run the Maintenance Looparound test (#886). If that test fails, maintenance software requests a system WARM restart. If, after the WARM restart, transmit buffer overflow errors continue to be reported, maintenance software resets the PKT-INT.

1. Check for errors logged against the Packet Data Line circuit packs associated with the System Ports, BRI Line circuit packs and BRI endpoints, and the Universal DS1 circuit packs supporting PRI service. Errors against those components should be cleared first.
2. Run Maintenance Looparound Test (#886). If test (#886) test passes, the alarm will clear. If the test fails, repeat the test 5 times. If it continues to fail, follow normal escalation procedures.

h Error Type: 3585 - This in-line error is generated when the PKT-INT has entered a “fatal fault” state due to the failure of the Packet Bus (see PKT-BUS (Packet Bus - S8100) on page 1414).

NOTE:
The PKT-INT is not taken out of service since it is used for running Packet Bus tests.

i Error Type: 3841 - This in-line error is generated when the PKT-INT enters its “fatal fault” state (the LANHO has gone insane). A PKT-INT fatal fault error and a Packet Bus LAN Critical error (PKT-BUS (Packet Bus - S8100) on page 1414) are also reported at the same time. The PKT-INT reset test is run when a LAN Critical Fault is detected. However, before the PKT-INT is reset, a check is made to see if the PPN Packet Bus has a major alarm, indicating that the Packet Bus rather than the PKT-INT is the source of the failure (see PKT-BUS (Packet Bus - S8100) on page 1414).

1. If error 3585 has also been reported, refer to PKT-BUS (Packet Bus - S8100) on page 1414. After the Packet Bus failure has been corrected, execute the **reset packet-interface** command to bring the Packet Interface circuit back into service.
2. If error 3585 has not been reported, enter the **reset packet-interface** command and follow the repair steps associated with test #882.
3. If the above step fails, enter **reset packet-interface [1a1 or 1a2] restart**.
4. If the test still fails, follow normal escalation procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the *Packet Interface Private Looparound* test for example, you may also clear errors generated from other tests in the testing sequence.

Table 647: Packet Interface System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Packet Interface Reset Test (#889)			X	D
Packet Interface Private Looparound Tests (#885)		X[2]		ND
Packet Interface Maintenance Looparound Test (#886)	X[2]	X[2]		ND
Read and Clear Counters Test (#887)	X	X		ND

1 D = Destructive; DR= Disruptive; ND = Nondestructive

2.This test is executed only for PKT 1a2

Private Looparound Tests (#885)

This test requests the Packet Interface circuit pack to execute its three private looparound tests: Level 2 looparound, Broadcast path looparound, and Level 3 looparound. These tests verify the health of the circuit pack's Packet Bus interface, as well as the translation RAM, inward and outward bound data paths, parity indications and CRC calculations, and the Level 3 processing firmware.

- Level 2 (LAPD) Link Looparound

  LAPD is a link level protocol that is used for all system links. This test verifies the health of the processing of these links.

- Broadcast Link Looparound

  Each ISDN BRI port has two associated broadcast signaling links, one for call control and one for maintenance and management. Since these links have separate routing circuitry from the Level 2 Looparound, this test forces a CRC error to verify the CRC hardware associated with the broadcast data path.

These tests are also run as part of the reset tests. If the Level 2 looparound test fail as background tests, a "fatal error" message will be sent to the Packet Interface maintenance software and the Packet Interface will be put in the "out-of-service" state. Therefore, it is expected that the repair procedures associated with Abort Code 1137 (out-of-service) would normally be followed when failures with the Level 2 and Level 3 tests occur.

Table 648: TEST #885 Private Looparound Tests

Error Code	Test Result	Description/ Recommendation
1006 1137	ABORT	Packet Interface circuit pack is in the out-of-service state so normal maintenance tests will not run on that circuit pack. **1** Request a Packet Interface circuit pack reset using the **reset packet-interface CS** or **reset packet-interface [1a1 or 1a2] restart** command. Refer to Packet Interface Reset Test (#889) on page 1463 for repair procedures.

Table 648: TEST #885 Private Looparound Tests

Error Code	Test Result	Description/ Recommendation
1334	ABORT	The Packet Interface circuit pack command queue is full. This should be a temporary condition caused by a high rate of commands being sent to a Packet Interface circuit pack. Continued operation with a full command queue will cause a system WARM restart that may escalate to more severe restart levels. **1** Retry the command at 10-second intervals, a maximum of 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals, a maximum of 3 times.
2500	ABORT	Internal system error **1** Retry the command.
	NO BOARD	The Packet Interface circuit pack is administered and is present but it is not detected as being physically present. **1** If the Packet Interface circuit pack is present, replace it.
1	FAIL	The Private Link Broadcast looparound test failed. The Packet Interface will enter a fatal fault state when this occurs and the Packet Interface Maintenance software should put the circuit in a out-of-service state. Therefore by the time further action is taken, it is expected that the test will abort with ABORT code 1137 and a demand reset or a demand restart should be used to test the circuit pack. **1** Reset the circuit pack using the **reset packet-interface CS** if this fails execute a **reset packet-interface 1a1 or 1a2 restart** command. Refer to the repair procedures in Packet Interface Reset Test (#889) on page 1463 for further action. **CAUTION:** Replacing the TN2314 processor circuit pack will disrupt service, see the TN2314 processor replacement procedures in this document before proceeding with step 2. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to Downloading the License and Authentication files in *Maintenance Procedures (555-245-103)*. **WARNING:** If the test continues to fail, replace the TN2314 processor circuit pack.

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Table 648: TEST #885 Private Looparound Tests

Error Code	Test Result	Description/ Recommendation
2	FAIL	The Private Level 2 looparound test failed. The Packet Interface will enter a fatal fault state when this occurs and the Packet Interface Maintenance software should put the circuit in a out-of-service state. Therefore by the time further action is taken, it is expected that the test will abort with ABORT code 1137 and a demand reset should be used to test the circuit pack. **1** Reset the circuit pack using the **reset packet-interface CS** if this fails execute a **reset packet-interface 1a1 or 1a2 restart** command. Refer to the repair procedures in Packet Interface Reset Test (#889) on page 1463 for further action. **CAUTION:** Replacing the TN2314 processor circuit pack will disrupt service, see the TN2314 processor replacement procedures in this document before proceeding with step 2. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. **2** If the test continues to fail, replace the TN2314 processor circuit pack.
	PASS	All the private looparound tests passed. The circuit pack is functioning properly. If the system is still unable to place calls on cabinets other than the SPE cabinet, then: **1** Display the error log using the command **display errors** and check for errors on the Packet Bus and Maintenance/Test circuit pack. Clear those errors first. **2** Check all other circuit packs connected to the Packet Bus in the same cabinet. Packet Bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane. Refer to the PKT-BUS (Packet Bus - S8100) on page 1414 for repair procedures.

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Maintenance Looparound Test (#886)

This test checks whether the Packet Interface circuit pack can send and receive data correctly. It establishes a LAPD link from a Packet Interface circuit pack back to the same Packet Interface circuit pack and transmits and receives test data over that testing link. While timing signals from the Packet Bus are used for the data transfer, the data itself is looped around on the circuit pack at the interface to the Packet Bus and does not get sent over the Packet Bus.

Table 649: TEST #886 Maintenance Looparound Test

Error Code	Test Result	Description/ Recommendation
1006 1137	ABORT	Packet Interface circuit pack is in the out-of-service state so normal maintenance tests will not run on that circuit pack. **1** Reset the circuit pack using the **reset packet-interlace CS** if this fails execute a **reset packet-interface 1a1 or 1a2 restart** command. Refer to the repair procedures in Packet Interface Reset Test (#889) on page 1463 for further action.
1139	ABORT	The Packet Bus is alarmed **1** Try to retire the alarm associated with the Packet Bus. Refer to the Alarm Log via the **display alarms** command. Refer to the maintenance documentation for Packet Bus Maintenance for further action. **2** Retry the command when the alarm associated with the Packet Bus is retired.
1373	ABORT	Could not establish the link loop around link to run this test. **1** Retry the command at 1-minute intervals, a maximum of 3 times.
2060	ABORT	Packet link bus went down during maintenance looparound test. **1** Retry the command at 1-minute intervals, a maximum of 5 times. **2** If there are errors associated with the Packet Bus, refer to the maintenance information associated with the Packet Bus.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals, a maximum of 5 times.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals, a maximum of 5 times.
	NO BOARD	The Packet Interface circuit pack present but it is not detected as being physically present. **1** If the Packet Interface circuit pack is present, replace it.

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Table 649: TEST #886 Maintenance Looparound Test *Continued*

Error Code	Test Result	Description/ Recommendation
1-3	FAIL	The test failed. Maintenance was unable to establish a looparound link from the Packet Interface circuit pack back to itself or was unable to receive data that was sent out over one side of the looparound link. **1** Issue the **test packet-interface CS** command to retry the test. If the same error code is observed, background maintenance software will automatically attempt to reset the circuit pack and clear the problem. **CAUTION:** Replacing the TN2314 processor circuit pack will disrupt service, see the TN2314 processor replacement procedures in this document before proceeding with step 2. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to Downloading the License and Authentication files in *Maintenance Procedures (555-245-103)* Retry the command and if the test fails, replace the circuit pack. **2** If the test continues to fail after replacing the circuit pack, run the **test packet P long** command. If any of the tests fail, the fault may be on the Packet Bus. Refer to the PKT-BUS (Packet Bus - S8100) on page 1414 for recommended repair procedures. **3** If the test continues to fail after the circuit pack is replaced and with no other alarms associated with the Packet Bus or circuit packs connected to the Packet Bus, follow normal escalation procedures.
	PASS	This test passed. The circuit pack and its interface with the SPE are functioning properly. If the system is unable to place calls on cabinets other than the SPE cabinet, then: **1** Check for errors on the Packet Bus and Maintenance/Test circuit pack. Solve those errors first. **2** Check all other circuit packs connected to the Packet Bus in the same cabinet. Packet Bus failures are likely to be caused by a faulty circuit pack connected to the backplane or bent pins on the back plane. **3** Check the Packet Interface circuit pack connections to the Packet Bus.

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Read and Clear Board Counters (#887)

This test involves sending commands to read on-circuit pack error counters on the Packet Interface. It also verifies the message interface between the SPE and the Packet Interface. This test reads and clears the Parity Error counter and FIFO Overflow counter. Information about the number of bad Translation

location is sent to maintenance software as an in-line error from the circuit pack so it is not necessary to read a counter location.

Table 650: TEST #887 Read and Clear Board Counters

Error Code	Test Result	Description/ Recommendation
1006 1137	ABORT	Packet Interface is in the out-of-service state so normal maintenance tests will not run on that circuit pack. **1** Request a Packet Interface reset using the **reset packet-interface 1a1 or 1a2 restart**.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals a maximum of 3 times.
2500	ABORT	Internal system error **1** Retry the command.

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Table 650: TEST #887 Read and Clear Board Counters *Continued*

Error Code	Test Result	Description/ Recommendation
256 512 768	FAIL	The Packet Interface on the active SPE has an error counter set. The following error codes are possible: 256: Parity error 512: FIFO overflow 768: Parity error and FIFO overflow error **1** If error code 256 or 768 is reported, the Packet Interface received a parity error off the Packet Bus. a. Check for alarms and errors logged against other circuit packs connected to the Packet bus in the Processor Port Network cabinet. A list of packet circuit packs is presented in the first section of this repair procedure. Refer to the repair procedures for those circuit packs, in this manual, to clear those errors first. **CAUTION:** Replacing the TN2314 processor circuit pack will disrupt service, see the TN2314 processor replacement procedures in this document before proceeding with step b. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack. b. Replace the TN2314 Processor circuit pack at a time that would cause the least disruption of service. The circuit pack is still functional but should be replaced. If error code 512 is reported, the receive FIFO in the PKT-INT has overflowed. For the current hardware configuration, only one Packet Interface is allowed. Retry the command after a 1-minute delay and if the test continues to fail: **2**) Replace the circuit pack at a time that would cause the least service disruption.
	PASS	The SPE is able to communicate with the Packet Interface.

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Packet Interface Reset Test (#889)

This test is destructive.

This test is run due to in-line errors, on demand, and as part of system restarts, cold 2 and above.

This test resets the Packet Interface and causes the PKT-INT to run a set of initialization tests. If all initialization tests pass, the reset causes a complete initialization of the PKT-INT. This is equivalent to a

hardware reset mode of the PKT-INT firmware. All links are lost, and all PKT-INT firmware counters are reset. Additionally, the LANHO will be reset.

If any of the initialization tests fail, the reset test fails, and the PKT-INT enters its fatal fault state. Otherwise, the reset test passes. This test is used when maintenance receives a fatal fault (counter 2) from the board.

Table 651: TEST #889 Packet Interface Reset Test

Error Code	Test Result	Description/ Recommendation
1362	ABORT	The system was unable to run this test, the PK-INT to be tested [1a1 or 1a2] is in service and is not available for reset. **1** Use the "status packet interface" command to determine the service state of the packet interface circuit pack. **2** If the circuit pack is "out-of-service", retry the reset command. **3** If the reset continues to abort with the same error code and the packet interface circuit is "out-of-service", follow the normal escalation procedure.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals a maximum of 5 times.
257-258, 263-264	FAIL	The reset test failed for that particular PKT-INT. **1** Retry the command at least 5 times. **2** If it still fails with the same error code, execute "reset packet-interface [1a1 or 1a2] restart." command. Retry the command at least 5 times. **CAUTION:** Replacing/Re-seating the TN2314 processor circuit pack will disrupt service, see the TN2314 processor replacement procedures in this document before proceeding with step 3. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to Downloading the License and Authentication files in *Maintenance Procedures (555-245-103)*. Retry the command and if the test fails, replace the circuit pack. **3** If it still fails, ***re-seat*** the TN2314 circuit pack. **4** Re-execute the test 5 times. **5** If it still fails, ***replace*** the TN2314 circuit pack and re-run the "*reset packet-interface [1a1 or 1a2] restart*." command.
	PASS	The reset command passed and the Packet Interface is operational.

PLAT-ALM (Platform Alarms)

S8700 / S8500 / S8300

The PLAT-ALM is a virtual MO used by Communication Manager to keep track of its media server and G700/G350 media gateway alarms. A MAJOR, MINOR, or WARNING alarm can be logged against this MO to indicate the presence of one or multiple:

- S8700, S8500, and S8300 media server alarms (against these MOs: ARB, DAJ1, DUP, ENV, FSY, LOGIN, NIC, RALM-SVC, SME, SVC_MON, _TM, UPS, and _WD)
- G700 media gateway alarms (against this MO: MED-GTWY)

> **NOTE:**
> The MO initials "CMG" can be seen in some G700 traps.

A technician who is using the SAT and finds an alarm against the PLAT-ALM MO should:

1. Access the server's Linux command line, by entering the SAT command **go shell**.
2. Log into the media server's Linux shell.
3. View the media server's current list of alarms, by executing **`almdisplay -v`**. (See ''Displaying Media Server Alarms'' .

   > **NOTE:**
   > If the **`almdisplay`** command returns a failure message, such as:
   > "`almdisplay: 4: Unable to connect to Multifilament`",
   > enter "**`man almdisplay`**" for command-related information.

4. Troubleshoot and clear the problems, by following the procedures for the MO listed under either:
   - — ''Media Server MOs and Alarms'' .
   - — ''G700 Media Gateway Alarms to the Media Server'' .

An alternative procedure for an alarm against the PLAT-ALM MO requires the technician to:

1. Log into the media server's Web interface.
2. View the media server's current list of alarms, by selecting the **Display Alarms** option.
3. Troubleshoot and clear the problems, by following the procedures for the appropriate MOs listed in the display.

   > **NOTE:**
   > After repairing the media server or media gateway, use the Linux command **`almclear`** to manually clear every media server or media gateway alarm. This action will also clear any alarms associated with the PLAT-ALM MO. (See ''Clearing Media Server Alarms''.

System Technician-Demanded Tests: Descriptions and Error Codes

This MO provides no on-demand tests for system technicians.

PMS-LINK (Property Management System Link)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
PMS-LINK	MINOR	**test pms-link l**	PMS Link
PMS-LINK	WARNING	**test pms-link**	PMS Link

Property Management System (PMS) is a stand-alone computer system that environments such as hotels or hospitals use for services such as reservations, registration, messaging, housekeeping, night audit, billing, and inventory. The PMS Link provides a communications channel between the switch and the customer-owned PMS so that the PMS can interrogate the system for information related to the following features:

- Message Waiting Notification
- Controlled Restriction
- Housekeeping Status
- Check-in/Check-out
- Room Change/Room Swap

The PMS device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack which is administered as a data extension. The PMS link to the processor is via a TN799 C-LAN port. For information about C-LAN connectivity, refer to CLAN-BD (Control LAN Circuit Pack) on page 599.

PMS Link maintenance provides a strategy for maintaining the link between the switch and a PMS device. The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. PMS Link Maintenance uses a "try-and-wait" mechanism for maintaining the PMS Link. If a PMS Link is torn down due to an error, PMS Link Maintenance attempts to bring up the link immediately. If the Link Setup fails, PMS Link Maintenance will wait for five minutes before the next retry. If the number of retries reaches a threshold (12), a Minor alarm is raised for service attention.

PMS Link Maintenance does not cover the maintenance of the elements composing the PMS physical link (the external PMS device, Data Module (PDM/MPDM/DTDM), Digital Line Port of a TN754 Digital Line circuit pack, ADU, or Data Line Port of TN726B Data Line circuit pack). If PMS Link Maintenance cannot restore the PMS Link, then the maintenance tests of these individual components of the PMS Link must be executed to diagnose faults. If **test pms-link** fails, no alarm will be generated.

The **list pms-down** command lists every meaningful event to the PMS that occurred while the link between the switch and the PMS was down. For example, any room status codes entered by hotel housekeeping staff during a time of PMS outage would be shown in this report.

Procedures for Restoring the PMS Link

1 Determine the status of the PMS Link.

Enter **status pms-link**, and make sure that the PMS Link is not busied out for maintenance. If the link is "down," then continue with the next step.

2 Where does the PMS Link connect?

Enter **display system-parameters hospitality**, and find out the destinations of the PMS Link.

3 Determine the status of the data extension.

Enter **status data *extension***, and verify whether the data extension is in the in-service/idle state. If the data extension is not available, then look for the extension number in `Alt Name` field of Hardware Error Log. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for resolutions.

4 Is the external PMS device available?

Make sure that the PMS device is ON-LINE and ready for service. Check the physical connectivity between Data Module and the PMS device.

5 If the problem is not found in the above steps, check the C-LAN board for any problems. For a description about the C-LAN board and its connectivity, refer to Downloading the License and Authentication files in *Maintenance Procedures (555-245-103)*.

When restoring the PMS link, it is necessary to execute maintenance test on different objects that comprise the PMS link. It is recommended that you busyout the PMS link before trying to restore the link. When the PMS Link is busied out, every PMS Link maintenance action is deactivated, and interference with tests of other MOs is prevented.

Hardware Error Log Entries and Test to Clear Values

Table 652: PMS Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test pms-link sh r 1**
18 (a)	0	**busyout pms-link**	WARNING	OFF	**release pms-link**
257 (b)	Any	Link Retry test (#215)	MINOR WARNING[2]	OFF	**test pms-link l**
513 (c)	Any	None			**test pms-link**
769 (d)	Any	None			
1025 (e)	40–49	None			
1281 (f)	10–19	None			
1537 (g)	N0–N9	None			
1793 (h)	Any	None			**test pms-link**
2049 (i)	Any	None			
2305 (j)	50–59	None			**release pms-link**, or **test pms-link**

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Table 652: PMS Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2561 (k)	Any	None			**test pms-link**
2817 (l)	100–109 200–209 300–309	None			
3073 (m)	70–79	None			
3841 (n)	20–29	None			

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 Minor alarms on this MO may be down graded to Warning alarms based on the value in **set options**.

Notes:

a The PMS Link has been busied out with **busyout pms-link**. The link is torn down. Enter **release pms-link** to restore the link.

b The Link Retry test (#215) fails. An error was detected when setting up the link. Refer to the *Procedures for Restoring the PMS Link* above.

c The PMS physical link is down for one of the following reasons:

- Cable to the PMS device is disconnected.
- The PMS device is powered off.
- The data extension to which the PMS device connects has been busied out.

Check the connectivity of wire and cable among wall jacket, data module, and the PMS device. Enter **status data *extension*** and verify that the data extension of the PMS device is in the in-service/idle state. If the data extension is not available, then see Procedures for Restoring the PMS Printer Link on page 1474.

d There has been no communication between the switch and the PMS for a period of time specified in "system hospitality" administration. The PMS Link is torn down. To clear this error, see Procedures for Restoring the PMS Printer Link on page 1474.

e The link was taken down because the switch could not receive an incoming message from the PMS. The message from the PMS repeatedly had corrupted data or the switch received requests for acknowledgment but never received a message to be processed. If this error type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.

f The link was taken down because the switch could not send an outgoing message. The message, which was sent but not acknowledged, was flushed. If this error type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.

g The PMS has been busied out for maintenance at the request of the PMS. The PMS Link is torn down. The reason code (N), if present, is that supplied by the PMS in the request message. If this error type recurs frequently (that is, more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. No alarm is raised against this error.

h Due to heavy call traffic, or the PMS protocol message rate being faster than the PMS/PBX protocol specifications allow, the PMS Link is torn down. PMS Link maintenance software will wait for five minutes before attempting to set up the link again. If this error type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. The PMS should be checked for adherence to message rate defined in the PMS/PBX protocol specifications. No alarm is raised against this error.

i The attempt to swap the database between PBX and PMS failed three times consecutively due to excessive PMS/PBX protocol violations, buffer overflows, or PMS Link outages. The PMS Link is NOT torn down. If this error type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. No alarm is raised against this error.

j The PMS Link was busied out with **busyout pms-link**, or it was brought down with **test pms-link long**. The PMS Link is torn down, and PMS Link maintenance stops attempts to reestablish the link in the case where the **busyout pms-link** was used. When **test pms-link long** has been used, PMS Link maintenance continues trying to reset the link. To restore the PMS Link after use a **busyout pms-link**, issue **release pms-link**. To restore the PMS Link after a **test pms-link long**, issue **test pms-link**.

k The PMS Link is physically established, but the protocol has not been started by the PMS before the protocol timer expires. The PMS Link is NOT torn down. If this error type occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. The PMS should be checked to make sure that it will attempt to start the protocol according to the PMS/PBX protocol specifications. No alarm is raised against this error.

l For Error Type 2817 look for the following AUX data:

- 10x The PMS violated the application protocol. The first message after a request to initiate a database exchange was not the start of a database exchange. The message is processed. If this error type with this aux data value occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.
- 20x The PMS violated the application protocol. The start of a database exchange was received in a state in which it was not expected. The message is ignored. If this error type with this Aux data value occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log.
- 30x The PMS violated the application protocol. The end of a database exchange was received when no exchange was in progress. The message is ignored. If this error type with this Aux Data value occurs frequently (more than once a month), advise the customer to call the vendor of the PMS to check out the PMS device. Once the PMS Link is successfully established, this error disappears from the Hardware Error Log. No alarm is raised against this error.

The PMS should be assessed for adherence to the PMS/PBX protocol specifications.

m The link was taken down by the switch because the threshold for application protocol violations has been exceeded by the PMS. The protocol never started and messages were received and/or messages were received in a state in which they were not expected. (Refer to Error Type 2817 for recommended strategy.)

n Link was taken down by the switch because the threshold for link protocol violations has been exceeded by the PMS. PMS is sending “garbage” to the switch.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. For example, by clearing error codes associated with the Link Tear Down test (#213), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down test (#213)		X	D
Link Retry test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is **destructive**.

This test disconnects the existing link between the system and the external PMS device. If the link has been disconnected already, then this test just returns "PASS." Every resource allocated for a PMS Link is released after this test.

Table 653: Test #213 Link Tear Down Test

Error Code	Test Result	Description / Recommendation
40	ABORT	Internal system error.
50		**1** Retry the command at 1-minute intervals up to 5 times.
1010	ABORT	The PMS Link has been busied out and placed in the out-of-service state.
		1 Enter **release pms-link** to release the PMS Link from busyout state.
		2 Retry **test pms-link long** to execute the test.
2012	ABORT	Internal system error.
		1 Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error.
		1 Retry the command at 1-minute intervals up to 5 times.
	PASS	The PMS Link is torn down.

Link Retry Test (#215)

This test sends a message to the PMS software process to make a data call to the extension where the PMS device connects. If the PMS Link is already up, then this test passes without making any data call.

Table 654: Test #215 Link Retry Test

Error Code	Test Result	Description / Recommendation
10	ABORT	Internal system error.
20		**1** Retry the command at 1-minute intervals up to 5 times.
30	ABORT	Internal system error.
		1 Refer back to Procedures for Restoring the PMS Printer Link on page 1474 for resolution.
1010	ABORT	The PMS Link has been busied out and placed in the out-of-service state.
		1 Enter **release pms-link** to release the PMS Link from busyout state.
		2 Retry **test pms-link** to execute the test.

1 of 2

Table 654: Test #215 Link Retry Test

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The PMS Link CANNOT be established. **1** Refer back to Procedures for Restoring the PMS Printer Link on page 1474 for restoring the PMS Link.
	PASS	The PMS Link is up.

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PMS-PRNT/JNL-PRNT (PMS Printer Link)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PMS-PRNT/JNL-PRNT	MINOR	**test journal [pms-log | wakeup-log] long**	PMS Printer/ Journal Printer
PMS-PRNT/JNL-PRNT	WARNING	**test journal [pms-log | wakeup-log]**	PMS Printer/ Journal Printer

A journal printer is a printer to which Emergency Access to Attendant, Wakeup and Property Management System (PMS) events are printed as they occur. The PMS-log printer is used as a backup of the PMS output device to print an audit trail of every PMS transaction and Housekeeping Status Change event when the PMS Printer Link is not available. There may be one or two journal printers. If there is one, every event is printed there. If there are 2, then emergency access, wakeup events, and scheduled reports are printed at one printer (JNL-PRNT), and PMS events are printed at the other (PMS-PRNT).

The scheduled report printer is where summaries of daily wakeup activity and emergency access activity are printed. If the customer requests a summary report, the report will be printed exactly once per day.

The distinction between Journal and Scheduled report printers is logical rather than physical. Whether or not there are two printers, the scheduled reports are always sent to the printer that journals the wakeup and emergency access events. A scheduled report will temporarily suspend the journal activity. Upon completion of the scheduled report, journaling will be resumed after the printing of every withheld event.

The journal printer device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack that is administered as a data extension. A journal printer device can also be connected through an ADU to a port on TN726B Data Line circuit pack. The journal printer's link to the processor is via a C-LAN port. For information about C-LAN connectivity, see CLAN-BD (Control LAN Circuit Pack) on page 599.

PMS/JOURNAL Printer Link Maintenance provides a strategy for maintaining the link between the system and a PMS device (an external Journal Printer device). The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. PMS Printer Link Maintenance uses a try-and-wait mechanism. If a PMS Printer Link is torn down due to an error, PMS Printer Link Maintenance will try to bring the link up immediately. If the link setup fails, PMS Link Maintenance will wait for five minutes before the next trial. If the number of retries reaches a threshold (15), a Minor alarm is raised for service attention.

PMS Printer Link Maintenance does not cover the maintenance of the elements composing the journal printer physical link (for instance, the external printer device, Data Module (PDM/MPDM/DTDM), Digital Line Port or ADU and Data Line Port). If PMS Printer Link maintenance cannot restore the PMS Printer Link, then the maintenance tests of individual components of the PMS Link must be executed to diagnose faults.

The **list pms-down** command lists every meaningful event to the PMS that occurred while the link between the switch and the PMS was down. For example, any room status codes entered by hotel housekeeping staff during a time of PMS outage would be reflected in this report.

Procedures for Restoring the PMS Printer Link

1. Determine the status of the PMS Printer Link.

   Enter **status journal-printer wakeup-log | pms-log** and make sure that the journal printer link is not busied out for maintenance. If the link is down, then continue to the next step.

2. Where does the journal printer link connect?

   Enter **display system-parameters hospitality** and find out the destinations of the PMS Printer Link.

3. Determine the status of the data extension.

   Enter **status data *extension*** and verify that the data extension is in the in-service/idle state. If the data extension is *not* available, look for the extension number in the `Alt Name` field of the Hardware Error Log. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for resolutions.

4. Is the external printer device available?

   Make sure that the printer device is ON-LINE and ready for service. Check the physical connectivity between Data Module and the printer device.

5. If the problem is not found in the above steps, check the C-LAN board for any problems. For a description of C-LAN connectivity, see CLAN-BD (Control LAN Circuit Pack) on page 599.

It should be noted that when restoring the PMS printer link, it is necessary to execute tests on different MOs that comprise the link; it is recommended that you busyout the PMS printer link before trying to restore the link. If the PMS printer Link is busied out, then every PMS printer Link maintenance action is deactivated, and interference with tests of other MOs is prevented.

Error Log Entries and Test to Clear Values

Table 655: PMS-PRNT/JNL-PRNT Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test journal wakeup-log | pms-log sh**
18 (a)	0	**busyout journal wakeup-log | pms-log**	WARNING	OFF	**release journal wakeup-log | pms-log**
257 (b)	Any	Link Retry test(#215)	MINOR[2] WARNING	OFF	**test journal wakeup-log | pms-log long**
513 (c)	Any				**test journal wakeup-log | pms-log**
769 (d)					

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures. Both PMS Printer and Journal Printer are administered to the same extension, and the printer is not connected. Refer to the *Procedures for Restoring the PMS Printer Link* above for resolution.

2 Minor alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a Craft busied out the Journal Printer Link. The link is torn down. Enter **release journal wakeup-log | pms-log** to restore the link.

b Link Retry test (#215) fails. Physical link cannot be set up, usually because of hardware problems such as power off or cable disconnect. See Procedures for Restoring the PMS Printer Link on page 1474.

c Physical link cannot be set up, usually because of hardware problems such as power off or cable disconnect. The PMS Printer Link physical link is down due to the following causes: cable to the printer device is disconnected, the printer device is powered off, or the data extension where the printer device connects to has been busied out. Check the connectivity of wire and cable among wall jacket, data module, and the printer device. Enter **status data *extension*** and verify that the data extension of the printer device is in the in-service/idle state. If the data extension is not available, then see Procedures for Restoring the PMS Printer Link on page 1474.

d Link idle timer; link comes down. This indicates that the printer device is in an off-line state, for example, paper jam or paper out. Check the printer device and act promptly to put it back to on-line state. Enter **test journal wakeup-log | pms-log** to set up the printer link.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. For example, by clearing error codes associated with the Link Tear Down test (#213), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down test (#213)		X	D
Link Retry test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is **destructive**.

This test disconnects the existing link between the system and the external printer device. If the link has been disconnected already, this test just returns PASS. Every resource allocated for a PMS Printer Link is released after this test.

Table 656: Test #213 Link Tear Down Test

Error Code	Test Result	Description / Recommendation
40	ABORT	Internal system error.
50	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 656: Test #213 Link Tear Down Test

Error Code	Test Result	Description / Recommendation
1010	ABORT	The link has been busied out to out-of-service. **1** Enter **release journal wakeup-log|pms-log** to release the link from busyout state. **2** Retry **test journal wakeup-log|pms-log l** to execute the test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal System error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The link is torn down.

2 of 2

Link Retry Test (#215)

This test sends a message to the journal printer management software process to make a data call to the extension where the printer device connects to. If the journal printer link is already up, this test passes without making any data call.

Table 657: Test #215 Link Retry Test

Error Code	Test Result	Description / Recommendation
10	ABORT	Internal system error.
20	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
30	ABORT	Internal system error. **1** See Procedures for Restoring the PMS Printer Link on page 1474 for instructions.
1010	ABORT	The PMS Printer Link has been busied out to out-of-service. **1** Enter **release journal wakeup-log|pms-log** to release the link from busyout state. **2** Retry **test journal wakeup-log|pms-log l** to execute the test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The link cannot be established. **1** See Procedures for Restoring the PMS Printer Link on page 1474 for instructions.
	PASS	The link is up.

PNC-DUP (PNC Duplication)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PNC-DUP	NA	**status pnc**	PNC duplication

In systems with the Critical Reliability option, the following components, which together comprise the Port Network Connectivity (PNC), are duplicated:

- Expansion Interface (EI) TN570 circuit packs in the port networks (PNs)
- Switch Node Interface (SNI) TN573 circuit packs in switch nodes
- DS1 Converter (DS1C) TN574 circuit packs for remote PN connections
- Fiber-optic cables (metallic in certain cases) connecting the above circuit packs
- DS1 facilities between the DS1Cs
- Switch Node Clock (SNC) TN572 circuit packs
- IP Server Interface (IPSI) TN2312AP circuit packs

Although not part of the PNC, Tone-Clock circuit packs are also duplicated in each PN. The PNC is available in two different configurations: direct connect, in which each port network is connected directly by fiber optic links to each other PN; and Center Stage Switch (CSS) which utilizes one or two switch nodes to interconnect the PNs. Direct connect systems can have up to two PNs. CSS systems with one switch node can have up to 15 PNs. CSS systems with three switch node can have up to 44 PNs. See the following figures.

PNC duplication architecture utilizes an active/standby duplication scheme, in which one complete set of PNC components supports call processing, while the duplicate PNC is held in reserve. All calls on the active PNC are simultaneously set up, or shadowed, on the standby PNC in order for it to be capable of instantly assuming active status when necessary, allowing for interchanges without service disruption (in the case of single faults).

The PNC-DUP MO tracks the health of the active and standby PNCs, controls planned and spontaneous interchanges, and manages related functions such as double call refresh and unrefresh, antithrashing, and so on. The main responsibility of PNC-DUP is to recover the system to full service in the event of a fault. In the event of multiple faults PNC-DUP will do its best to maximize service continuity.

PNC duplication does not introduce any additional types of hardware or hardware faults, and there are no tests associated with the PNC-DUP MO. Instead, error log entries are used to log useful information about the occurrence and causes of interchanges. This is done in order to facilitate diagnosis of problems, which can then be addressed by using the documentation for the individual MO involved.

PNC-DUP Related Commands

The following commands and their output are described in *Maintenance Commands Reference (555-245-101)*.

status pnc	Lists information about the operational status of both PNCs including state of health, alarms, busyouts and locks.
reset pnc interchange	Initiates a demand PNC interchange. If the standby is healthy with state of health indexes all 0, there is no effect on service. Otherwise, calls may be dropped.
set pnc	Locks or unlocks the active PNC, preventing interchanges. It does not interfere with double call setup.
busyout pnc	Removes the standby PNC from service. See also Busyouts and PNC-DUP.

Busyouts and PNC-DUP

Busyout pnc puts the standby PNC in the busyout state, and:

- Double call set up is turned off.
- The standby PNC is unrefreshed; existing duplicate call connections are removed.
- PNC interchanges are prevented.

Upon release, interchanges are re-enabled and a global refresh of double call setup on the standby is performed.

When PNC duplication is in effect:

- An active PNC component cannot be busied-out.
- A standby PNC component can only be busied-out when the standby PNC is first busied-out.
- The standby PNC cannot be released unless all standby PNC components are released.

Figure 114: Duplicated Direct Connect PNC Connectivity

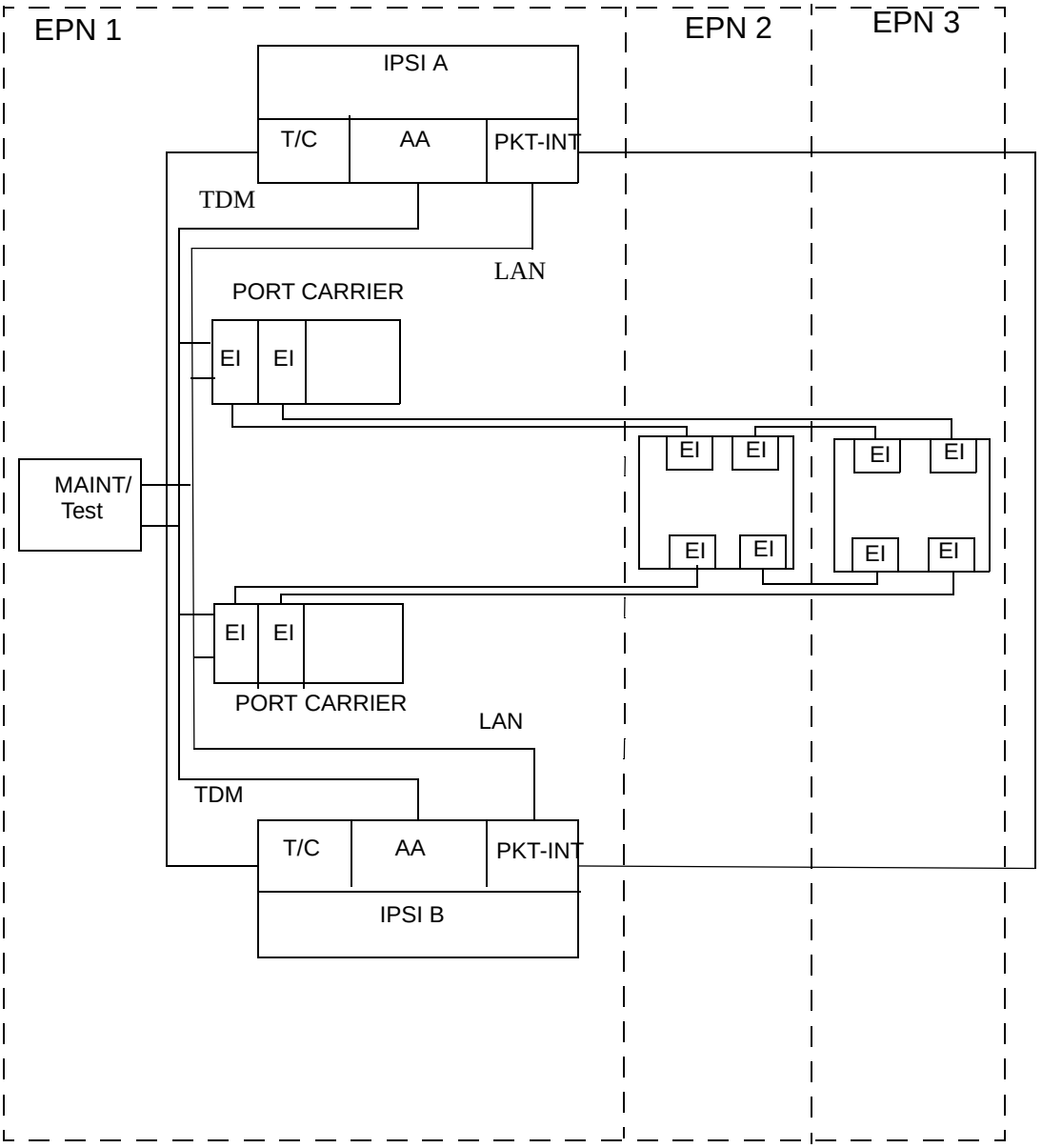
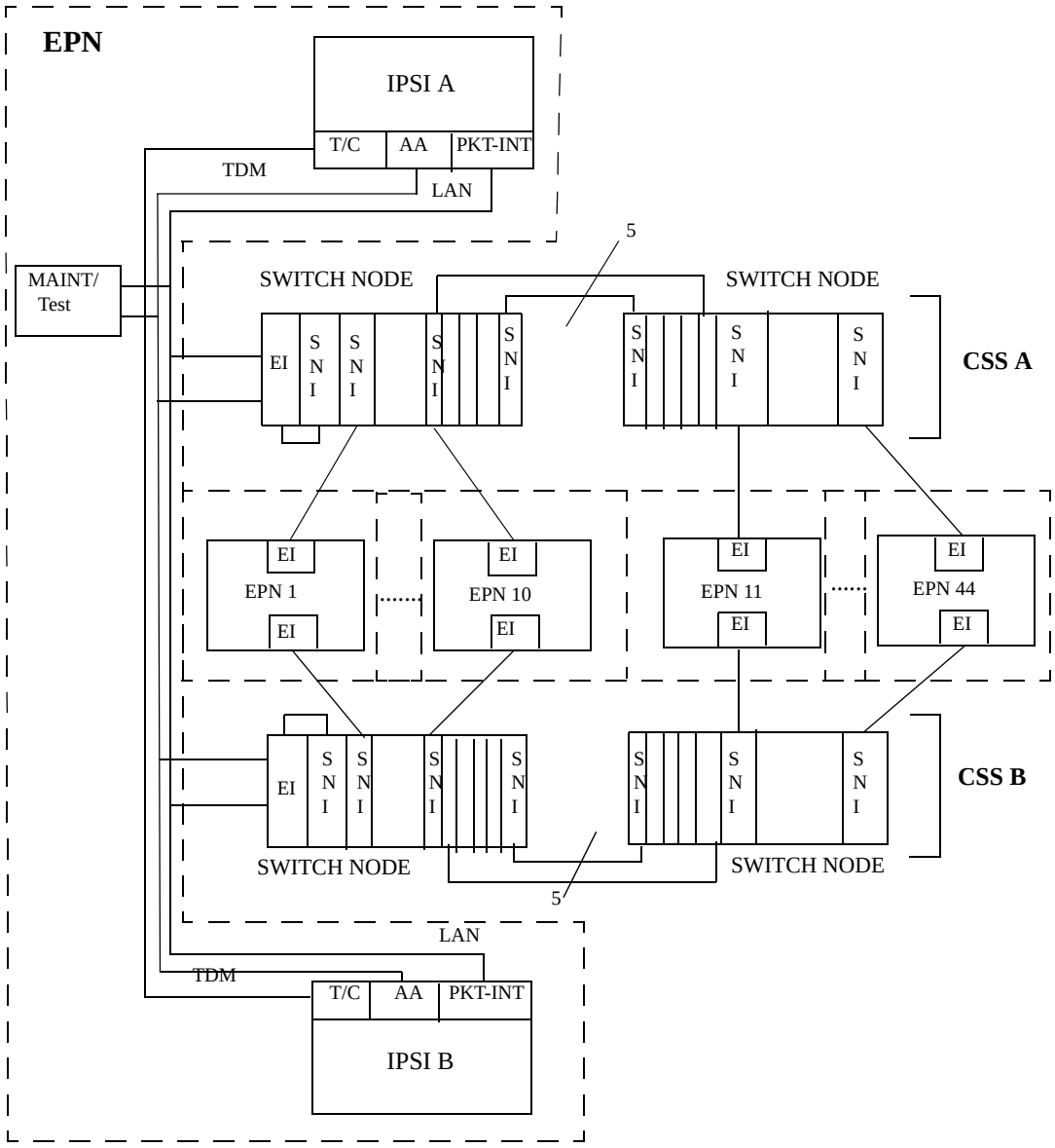


Figure 115: Duplicated PNC with Center Stage Switch Connectivity



Enabling and Removing PNC Duplication

NOTE:
PNC duplication requires IPSI duplication.

To Enable PNC Duplication

To enable PNC duplication perform the following sequence of steps:

1. Enable PNC-DUP on the **change system-parameters customer-options** screen.
2. Fully administer duplicate fiber link connectivity. Verify by **list fiber-link**. For IP Duplication go to step three.
3. Fully administer IPSI duplication (**ipserver-interface duplication**). Verify by using **list ipserver-interface**.
4. Turn on PNC-DUP via the **change system-parameters duplication** screen. This is note allowed if any component of either PNC (A or B) is busied out.
5. The system must insert all connectivity-related components for both standby and active PNC. For CSS configurations this takes up to 5 minutes depending upon CSS circuit pack insertion. For Direct Connect configurations this is declared complete at 5 minutes after the first appearance of the terminal login prompt.
6. The PNC-DUP initialization anti-thrashing timer must expire (this occurs 5 minutes after completion of board insertion, PNC interchange, or system reset of level 2 or higher).

To Disable PNC Duplication

To disable PNC duplication perform the following sequence of steps:

1. Verify that the A-PNC is active. A forced interchange may be required. See **reset pnc** in Chapter 8.
2. Busyout the standby PNC (B-PNC).
3. Turn off the system parameter for PNC-DUP via **change system-parameters duplication**.

   After PNC duplication has been removed, configuration audits will generate the alarm shown below and possibly others. To clear this alarm, the B-PNC fibers, circuit packs in switch node carriers (EIs, SNIs, SNCs, and DS1Cs), and switch node carriers must be removed as outlined in the following steps.

   ```
   01D   SN_CONF     5000  255
   ```

   In this case, 01D is the B-PNC switch node from which duplication was removed.
4. Remove the B-PNC fibers by removing the Endpoint Board Locations on the **change fiber-link** screen for all fibers. For fibers using DS1Cs, remove the B-PNC DS1C Board Locations on page 3 of the **change fiber-link** screen.
5. Remove the B-PNC circuit packs starting with the switch node carrier most distant from the media server complex. Use **change circuit-pack *UUCSS***, page to the B-PNC carrier and remove all of the circuit packs there. Remove all circuit packs in the other B-PNC switch node carriers.

   If the Expansion Interface circuit pack associated with the PN is located in the switch node carrier closest to the media server, it cannot be removed from translation until it has been busied-out and disconnected from the carrier slot.

When SNI, SNC, or DS1C circuit packs are removed from a B-PNC carrier, any alarms against them should be resolved.

6 Remove the B-PNC switch node carriers. Use **change cabinet *UUC*** and enter **not-used** for B-PNC carriers.

Any alarm against the carrier such as 01D SN-CONF should be resolved. The B-PNC carriers and associated circuit packs should not be alarmed.

7 Disable PNC duplication on the **change system-parameters customer-options** screen by changing "PNC Duplication" to **no**.

If an alarm exists against any Expansion Interface circuit pack connected to a B-PNC carrier, attempt to use **test board *UUCSS* long clear** to clear the alarm.

Alterations to PNC which involve only the *addition* of fiber connectivity can be done with PNC-DUP operational. Alterations requiring the *removal* of fiber connectivity must be done with PNC-DUP removed. PNC-DUP must be removed and translations should be saved before any hardware changes are made.

Steady State LEDs

The LEDs of PNC components in a stable duplicated system should appear as follows:

- The *active* IPSIs are functioning as archangels in IPSI port networks.
- The *active* EIs in the PNs are functioning as archangels. Their LEDs flash in a pattern of 2 seconds on 200 milliseconds off (PN ***without*** an IPSI).
- The PN standby EIs amber LEDs are off (PN ***without*** an IPSI).
- The PN active EI amber LED is on solid (PN ***with*** an IPSI).
- The PN standby EI amber LED is off (PN ***with*** an IPSI).
- The SNIs on the active switch node(s) have amber LEDs on solid.
- The SNIs on the standby switch node(s) have amber LEDs off.
- Active DS1Cs amber LEDs are on solid.
- Standby DS1Cs amber LEDs are off.
- DS1C facility green LEDs are on if the corresponding facility is equipped.

PNC State of Health

PNC-DUP software monitors the health of the two PNCs as determined by their state of health (SOH) vectors, and initiates an interchange when the health of the active falls below that of the standby (unless prevented from doing so by a PNC lock, busyout, or antithrashing mechanism). Potentially service-disrupting faults which occur in PNC components are reported to PNC-DUP and incorporated in the state of health for the affected PNC. The SOHs of both PNCs are displayed on the **status pnc** screen.

Figure 116: Status PNC Screen with Standby PNC Fully In-Service

```
status pnc                                                  page 1 of 1
                          PORT NETWORK CONNECTIVITY

                             Duplicated? yes
                          Software Locked? no
                           Standby Busied? no
                           Direct Connect? no
                         Standby Refreshed? yes
                      Interchange Disabled? no

              A-PNC                                B-PNC

           Mode:  active                        Mode:  standby
State of Health:  functional          State of Health:  functional
 Inter PN Index:  00.00.00.00.00       Inter PN Index:  00.00.00.00.00
 Inter SN Index:  00.00                Inter SN Index:  00.00
   Major Alarms:  0                      Major Alarms:  0
   Minor Alarms:  0                      Minor Alarms:  0
 Warning Alarms:  0                    Warning Alarms:  0
   SN Locations:  01E                    SN Locations:  01D
```

PNC State-of-Health Indexes

The Inter-PN and Inter-SN Indexes form the state of health vector, which is used to track and compare the states of health of both PNCs. The fields making up the indexes are two digit numbers separated by periods (.), with each field representing a different class of faults. The fault class fields are arranged in order of decreasing importance from left to right. In other words, each field in the index supersedes the following fields in determining which PNC is healthiest. A fault class drives an interchange only when all of the higher priority fault classes are equal. A zero entry indicates no faults in that class. Increasing numbers indicate increasingly higher numbers of faults present in that class.

The Inter-PN Index contains six fields (XX.XX.XX.XX.XX.XX), and the Inter-SN Index has two (XX.XX). The Inter-PN Index reports faults in connectivity between port networks and supersedes the Inter-SN Index, which reports faults in connectivity between switch nodes. (The Inter-SN Index is only meaningful for systems with a center stage switch having two switch nodes, each of which is duplicated).

The meaning of each fault class field is given in the following table. A zero entry indicates that there are no such faults reported. Higher numbers indicate increasing number of faults. All zeros indicates perfect state of health. Unless the PNCs are locked, the active PNC’s state of health should always be equal to or better than the standby’s. (Otherwise, the system would perform a spontaneous interchange.)

After a PNC-related alarm is cleared, the system performs a partial refresh of the standby PNC. The corresponding fault class field is not updated to reflect the improved state of health until the refresh is done. The state of health indexes will not agree with the current alarm status during this period.

Inter SN Index: FC_SNIL s11.s10 FC_SNIHW

Table 658: PNC State-of-Health Fault Classes

Fault Class	Priority	Description	MOs
FC_EAL	1	Number of PNs with EALs down	EXP-PN
FC_INL	2	Number of PNs with LINL, RINL, or EI-SNI neighbor link faults	EXP-PN, SN-CONF
FC_BFD[1]	3	Number of PNs with BFDL (Bearer Fault Detection Link) faults	SYS-LINK
FC_HW	4	Number of PNs affected by hardware faults in a link having an EI as an endpoint (Endpoints can be determined with **list fiber-link**.)	EXP-INTF, SN-CONF, FIBER-LK, SNI-BD, DS1C-BD
FC_PER	5	Number of PNs affected by SNI peer link faults for SNIs connected to EIs	SNI-PEER
FC_DS1	6	Number of PNs affected by DS1C facility faults	DS1FAC
FC_SNIL	7	Number of inter-switch-node fibers affected by peer or neighbor link faults	SNI-PEER
FC_SNIHW	8	Number of interswitch-node fibers affected by hardware faults	SN-CONF, SNI-BD, FIBER-LK

1 BFDLs only exist in Port networks that have an IPSI. Port networks that do not have an IPSI will have the EI as Archangel and no BFDL faults.

In multinode CSS configurations FC_DS1 is considered less critical that FC_SNINL since DS1C constraints affect only one PN and indicate restricted bandwidth. However FC_SNINL can indicate problems for all PNs on the far end switch node (the one downlink from the PN) If the DS1C problem is critical (for example, loss of all bandwidth to the affected PN) a constraint with a higher order fault class will be reported to PNC DUP.

Resolving Poor State of Health

When the SOHs for both PNCs are not all zeros, identify and repair the problem:

1. Look for PNC component alarms (major or minor) for the PNC side whose SOH is not all zero. First repair the standby PNC.
2. Busy-out the standby PNC.
3. Follow the diagnostic and repair procedures for the alarmed PNC components just as with a unduplicated PNC. Examine the alarm logs and error logs to isolate the fault.
4. Verify that the related PNC SOH is restored to all zeros.
5. Release the standby PNC for busy-out.

Refresh and Unrefresh of the Standby PNC

In a fully functional PNC with healthy standby and active sides, the standby PNC has a complete set of call connections corresponding to those in the active PNC. If, however, the state of health of the standby PNC degrades, a selective unrefresh of those connections which utilize the faulted component(s) is performed. If the health of the standby PNC improves, a selective refresh of connections on the affected route is performed, so that call setup is consistent between the active PNC and the healthy parts of the standby PNC.

The `Standby Refreshed` field on the **status pnc** screen does not refer to the selective type of refresh. It refers only to a global refresh that is performed when:

- The system is initialized and PNC duplication is enabled.
- There has been a spontaneous PNC interchange.
- The standby PNC has been released from busy-out.
- A system reset of level 2 or higher has taken place.

The `Refreshed` field may show **y** when the standby is partially unrefreshed. An interchange into an incompletely refreshed standby results in dropped calls. This can happen when a more severe fault occurs on the active PNC, or when **set pnc interchange** is used with the override option.

PNC Interchanges

PNC spontaneous interchanges occur when PNC duplication software determines that the SOH of the standby PNC is better than that of the active PNC. PNC-DUP executes a spontaneous interchange only when a message from a PNC component MO sends a message indicating that either a fault has occurred on the active PNC, or a fault has been resolved on the standby PNC such that the state of health of the active PNC is now lower than that of the standby.

This message will usually indicate the type and location of the failed connectivity component. A corresponding major or minor alarm is logged by the reporting MO, stimulating an alarm report.

In the less common situation when the resolution of a fault on the standby renders it more healthy than a simultaneously faulted active PNC, the message will indicate the type and location of the *improved* component.

Once the interchange completes, the failed component will be on the standby PNC. A demand interchange can be requested in the presence or absence of standby PNC faults. The following sequence of actions can be observed during a fault-free interchange:

1. The Expansion Interfaces currently acting as archangels in the PNs are deactivated as indicated by the amber LEDs going from flashing to on solid.
2. The EIs in IPSI port networks are interchanged as indicated by the new standby EI amber LED off and the new active EI amber LED on solid.
3. One by one the EIs in non-IPSI port networks are interchanged as indicated by new standby EI amber LED turning off and the new active EI amber LED flashing (2 seconds on, 200 milliseconds off). At this point the interchange is functionally complete.
4. The SNIs amber LEDs are updated. so that the SNIs on the active SN have amber LEDs on, while the standby SN’s SNIs amber LEDs turn off.

Certain conditions may interfere with the normal execution of the interchange:

1. In a faulted spontaneous interchange it is possible the PN directly affected by the fault will be the last to interchange.
2. A user directly affected by the single fault instigating a PNC interchange can experience a momentary outage of voice path connectivity during the switch.
3. If faults exist on both the standby and active PNC, it is possible to have some PNs go out of service while others are returned to service.
4. The new standby SNIs amber LED my not be off due to a fault in the line of communication path to the standby SNIs. In a multi-fault interchange, LEDs on the new active SNIs may not be on for the same reason.

In any multifault situation, use **status pnc** to determine which is the active PNC.

PNC duplication informs Timing Synchronization maintenance when a PNC interchange has been completed and indicates which PNC is active. This causes Synchronization to audit and insure that the primary source for synchronization of Tone-Clocks in each PN is supplied by a path associated with the active PNC.

Antithrashing and PNC Interchanges

Following a spontaneous PNC interchange, subsequent PNC interchanges are prevented for 5 minutes. This condition is indicated by a **y** in the `Interchange Disabled` field of the Status PNC screen. After 5 minutes, the antithrashing, timer expires, interchange decisions are re-enabled, and the field entry is **n**.

NOTE:
Should a catastrophic failure occur on the active PNC during the period when “Interchange Disabled?” is set to “yes” there will be no spontaneous PNC interchange.

Demand PNC interchanges also invoke anti-thrashing, but only for a period of 30 seconds. During antithrashing mode, demand interchanges are also prevented unless the override option is specified. Use of this option will cause a service disruption.

Repairs on the Standby PNC Components

CAUTION:
If there is a TDM-CLK alarm, system timing may be routed through part of the standby PNC, and circuit switched data may be affected by the following repair procedures. This can happen, for example, when a slave tone/clock circuit pack experiences a loss of signal and switches to receive timing from the standby EI. In this case TDM-CLK 2305 error will be logged, and the clock problem should be addressed first, if possible.

To repair PNC components in a duplicated PNC:

Most repairs involve fixing a single fault on the standby PNC.

1. Use **set pnc lock** or **busy-out pnc** to prevent an interchange into the PNC being repaired.

   If a faulty component exists on the currently active PNC, the standby PNC is more severely faulted. Normally the standby PNC is repaired first because it is the most severely impaired.

2 To repair the active PNC, use **reset pnc interchange override-and-lock** to request an interchange and ensure that no subsequent interchange occurs during the repair of the standby PNC.

   The demand interchange may not be necessary if the following conditions drive a spontaneous interchange:

   - The anti-thrashing period from the last interchange has expired.
   - The global refresh from releasing the standby PNC has completed.

   The standby PNC SOH is better than the active.

3 At this point, the faulty component is on the standby PNC, and the PNCs are locked in their current active/standby state. Busy-out the PNC.

4 Use fault isolation and component testing procedures for the individual PNC components. Replacement of components will not disrupt operation of the active PNC.

5 Once the failed component is replaced, test the standby PNC component from the terminal to ensure the replacement is functioning properly.

6 When the problem is resolved as indicated by a state of health with all zeros, (**status pnc**), unlock and release the pnc.

No further PNC interchange is required because you can test the standby PNC as thoroughly as the active.

Interactions: Media Server Resets and PNC Interchanges

- A system reset of level 1 (warm), 2 (cold2) or 4 (reboot) does not change which PNC is active. If a PNC interchange was in progress when the reset took place, the PNC interchange still goes to completion.
- If a system reset level 1 (warm) takes place during a PNC interchange, the reset is escalated to level 2 (cold2).

Fault Isolation Using Duplicated PNC

PNC duplication, can, in some cases aid in the isolation of faults. PNC interchanges can be used to help indict the faulty hardware. Following are two examples demonstrating this technique.

- There is a fault which can occur in either an IPSI port network's EI or the PKT-INT which cannot be readily attributed to one board or the other. If the packet bus transceivers on the PKT-INT or EI fail, it will be apparent that the two boards cannot communicate, but it will not be clear which board is at fault. In this case, a planned interchange of the PNC can be used to indict one of the two boards. If the interchange cures the problem, the EI was at fault. If the interchange does not cure the problem, the PKT-INT is suspect, provided there are no PKT-BUS faults.
- A similar relationship exists for the PN Archangel (active EI) and certain TDM bus problems. If the EAA cannot communicate with a port board over the TDM bus, then the EAA has a fault, the port board has a fault, or there is a problem with the TDM bus itself.
  - — If TDM bus maintenance tests find no problems with the bus, then it is either the port board or the EAA. It may be simpler to replace the port board than to request a PNC interchange.

— If it is not clear which port board may be at fault, or maintenance is being performed remotely, verify that the EAA is not at fault by executing a PNC interchange. If the interchange solves the problem, then the EAA is faulty.

— If the problem persists after the interchange, but TDM bus maintenance finds no problem, then the port board is faulty.

Error Log Entries

When a PNC interchange takes place, an error is logged against PNC-DUP with a code that conveys information about the cause of the interchange and which PNC became active. There are no alarms associated with PNC-DUP errors. There should be an alarm against the PNC component that drove the interchange.

There are no PNC-DUP test sequences. Use **status pnc** to see information regarding the status of the PNCs.

The information in the following tables helps identify areas of the Alarm Log to investigate in order to find the source of the problem.

Error Code	Aux Data		Error Code	Aux Data
00000 (a)	None		20200 – 20263 (s)	1
10000 – 10063 (b)	1		20300 – 20363 (t)	1
10100 – 10163 (c)	1		20400 – 20463 (u)	1
10200 – 10263 (d)	1		20500 – 20563 (v)	1
10300 – 10363 (e)	1		20601 – 20664 (w)	1
10400 – 10463 (f)	1		20701 – 20764 (x)	1
10500 – 10563 (g)	1		21000 – 21063 (y)	1
10601 – 10664 (h)	1		21100 – 21163 (z)	1
10701 – 10764 (i)	1		21200 – 21263 (aa)	1
11000 – 11063 (j)	1		21300 – 21363 (ab)	1
11100 – 11163 (k)	1		21400 – 21463 (ac)	1
11200 – 11263 (l)	1		21601 – 21664 (ad)	1
11300 – 11363 (m)	1		21701 – 21764 (ae)	1
11400 – 11463 (n)	1		51000 (af)	1
11601 – 11664 (o)	1		52000 (ag)	1
11701 – 11764 (p)	1		53000 (ah)	1
20000 – 20063 (q)	1		60801 (ai)	1
20100 – 20163 (r)	1		60800 (aj)	1

1 The Aux Data indicates which PNC became active after the PNC interchange: “0” denotes PNC-A; “1” denotes PNC-B.

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
18	None	**busy PNC-DUP**	WARNING	ON	**release pnc-dup**

Notes:

a An error took place in generating the error code.

b A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_EAL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (10003 points to port network 4) **List config port-network** gives the cabinet number associated with a port network.

c A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_INL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (10003 points to port network 4) **List config port-network** gives the cabinet number associated with a port network.

d A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_HW. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (10203 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

e A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_PER. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (10303 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

f A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_DS1. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (10403 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

g A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_BFD. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (10203 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

h A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_SNIL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the error code indicate the fiber-link number (01-64) of the fiber that reported the retired alarm. **List fiber-link** gives the location of the fiber.

i A spontaneous PNC interchange took place in response to the retiring of an alarm on the A-PNC associated with fault class FC_SNIHW. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the error code indicate the fiber-link number (01-64) of the fiber that reported the retired alarm. **List fiber-link** gives the location of the fiber.

j A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_EAL. This indicates that one or more Expansion Archangel Links are down. Investigate any EXP-PN alarms. Adding 1 to the last two

digits of the error code gives the PN number of the port network that reported the alarm. (11003 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

k A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_INL. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (11103 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

l A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_HW. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (11203 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

m A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_PER. This indicates one or more faults on peer links that connect SNIs to EIs. Investigate any alarms against SNI-PEER. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (11303 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

n A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_DS1. This indicates faults on one or more DS1C facilities. Investigate any alarms against DS1-FAC. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (11403 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

o A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_SNIL. This indicates one or more faults on peer or neighbor links between SNIs on different switch nodes. Investigate any alarms against SNI-PEER. The last two digits of the error code indicate the fiber-link number (01-64) of the fiber that reported the retired alarm. **List fiber-link** gives the location of the fiber.

p A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the A-PNC associated with fault class FC_SNIHW. This indicates one or more faults on hardware connecting SNIs on different switch nodes. Investigate any alarms against SN-CONF, SNI-BD, FIBER-LK. The last two digits of the error code indicate the fiber-link number (01-64) of the fiber that reported the retired alarm. **List fiber-link** gives the location of the fiber.

q A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_EAL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (20003 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

r A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_INL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (20103 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

s A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_HW. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (20203 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

t A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_PER. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (20303 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

u A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_DS1. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (20403 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

v A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_BFD. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the retired alarm. (20203 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

w A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_SNIL. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the error code indicate the fiber-link number (01-27) of the fiber that reported the retired alarm. **List fiber-link** gives the location of the fiber.

x A spontaneous PNC interchange took place in response to the retiring of an alarm on the B-PNC associated with fault class FC_SNIHW. Use **status pnc** to look at the state of health indexes for the PNCs, and investigate any associated alarms. The last two digits of the error code indicate the fiber-link number (01-27) of the fiber that reported the retired alarm. **List fiber-link** gives the location of the fiber.

y A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_EAL. This indicates that one or more Expansion Archangel Links are down. Investigate any EXP-PN alarms. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (21003 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

z A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_INL. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (21103 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

aa A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_HW. This indicates that one or more neighbor or indirect neighbor links with an EI as an endpoint have experienced faults. Investigate any alarms against EXP-PN and SN-CONF. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (21203 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

ab A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_PER. This indicates faults on peer links that connect SNIs to EIs. Investigate any alarms against SNI-PEER. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (21303 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

ac A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_DS1. This indicates faults on one or more DS1C facilities. Investigate any alarms against DS1-FAC. Adding 1 to the last two digits of the error code gives the PN number of the port network that reported the alarm. (21403 points to port network 4.) **List config port-network** gives the cabinet number associated with a port network.

ad A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_SNIL. This indicates faults on peer or neighbor links between SNIs on different switch nodes. Investigate any alarms against SNI-PEER. The last two digits of the error code indicate the fiber-link number (01-27) of the fiber that reported the alarm. **List fiber-link** gives the location of the fiber.

ae A spontaneous PNC interchange took place in response to the occurrence of a major or minor alarm on the B-PNC associated with fault class FC_SNIHW. This indicates faults on hardware connecting SNIs on different switch nodes. Investigate any alarms against SN-CONF, SNI-BD, FIBER-LK. The last two digits of the error code indicate the fiber-link number (01-27) of the fiber that reported the alarm. **List fiber-link** gives the location of the fiber.

af A spontaneous PNC interchange took place upon the expiration of the anti-thrashing timer.

ag A spontaneous PNC interchange took place upon the unlocking of the PNCs with the **set pnc unlock** command.

ah A spontaneous PNC interchange took place upon the completion of a global refresh of the standby.

ai A demand interchange was executed with the **reset pnc interchange** command.

aj A demand interchange was executed with the **reset pnc interchange** command using the **override-and-lock** option.

POWER

S8700 MC

Battery and Charger for AC-Powered Systems

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
POWER	MINOR	**test environment *UU***	Battery and Battery Charger

1 ***UU*** is the cabinet number indicated in the PORT field from the Alarm or Error Log.

S8700 Multi-Connect systems support two different cabinet types: multicarrier and single carrier. Single carrier cabinets are used only for PNs. Both cabinet types may be powered by AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply.

AC-powered multicarrier cabinets can be equipped with rechargeable batteries that provide backup power during short power outages. Battery backup is optional on cabinets powered by an uninterruptable power supply (UPS), and is required on those that are not. DC-powered cabinets and single-carrier cabinets do not have battery backup, and this MO is not valid for those cabinets.

The battery backup for the J58890CH unit consists of one battery assembly and charger. The battery backup for the J58890CE unit consists of three 48V batteries and a battery charger. Each cabinet so equipped has its own independent battery backup unit. When power to the cabinet is interrupted, a warning alarm is logged against AC-POWER and the system draws power from the backup batteries. This is known as Nominal Power Holdover (NPH). If power is restored before the NPH time expires, the alarm is resolved. If power does not return, error logs are saved to the Mass Storage System. The nominal power holdover provided is as follows:

PN cabinet	Holdover
All carriers	15 seconds
Expansion control carrier	10 minutes

When AC power is restored after an outage, the battery charger fully recharges the batteries within 30 hours.

In a multicarrier-cabinet system, the Battery and Battery Charger MO represents the battery charger and the battery which are located in the lower left corner of the cabinet. Should anything go wrong with the battery or charger, they must be replaced using the procedure described in Replacing the Battery and Battery Charger (J58890CE) on page 1494. The system will detect one of the following three problems with the batteries or charger:

- Reserve Fault: the charger has detected a problem within itself or the batteries and has notified the system.
- High Charge Rate: the batteries have been charging at a high charge rate for an excessively long period of time. This indicates that there is a short in the batteries or the charger.
- Prepare to Disconnect (Low Battery): the batteries are in danger of being drained to a point where the batteries would be damaged. This warning often occurs after multiple power failures.

The batteries take 30 hours to fully charge after being drained. A fully charged battery pack should bridge two power failures without causing a low battery warning to occur.

Replacing the Battery and Battery Charger (J58890CE)

1 Move the power switch on the battery charger to OFF.

WARNING:
Always turn off the battery charger before replacing the batteries. Failure to do so will result in damage to the 397C battery charger.

2 Disconnect the cord from the outlet on the front of the battery charger.

3 Remove the screw at the top left of the cover and open the cover to access the charger.

4 Check the battery voltages at the test points. Check all 3 batteries wired in series (the voltage should be 144 Volts, 3 X 48 Volts = 144 Volts).

NOTE:
An ordinary voltmeter can be used to check battery voltages at the test points, but it may not produce valid results. If the battery voltage readings are below 48 Volts (the voltages at test points should read 144 Volts, 3 x 48 Volts = 144 Volts), the battery is probably defective. However, a normal voltage reading does not necessarily mean the battery is good; under load, a defective battery with a normal reading on the voltmeter may discharge rapidly.

5 Check the battery dates and the preventive maintenance log. Replace the batteries if they are more than 2.5 years old.

NOTE:
If any defective batteries are found, replace all of them. Batteries are ordered in sets of three and should be replaced as such.

6 If no defective batteries are found, replace the entire charger.

7 Close the cover and secure it with the screw.

8 Reconnect the cord and move the power switch to ON.

Replacing the Battery Assembly (J58890CH)

The batteries are replaced as an entire assembly.

1 Check the battery voltages at the test points on the BIU (Battery Interface Unit).

2 Remove the BIU from the power distribution unit.

3 Disconnect the battery plug from the power distribution unit (J20).

4 Remove the battery assembly from the rear of the cabinet.

5 Install the new battery assembly in the reverse order.

6 Plug the BIU back into the power distribution unit.

Error Log Entries and Test to Clear Values

Table 659: Battery and Battery Charger Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test environment *UU* sh r 1**
1	Any	Battery and Battery Charger Query test (#5) (error code 8)	MINOR	ON	**test environment *UU* s r 1**
257	Any	Battery and Battery Charger Query test (#5) (error code 4)	MINOR	ON	**test environment *UU* s r 1**
769	Any	Battery and Battery Charger Query test (#5) (error code 2)	MINOR	ON	**test environment *UU* s r 1**
3840 (a)	1005 or 1028	Associated Battery and Battery Charger Query test (#5)			**test environment *UU* s r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Note:

a Check to see if the battery charger is connected. If the cabinet is powered by a UPS, there is no battery backup, and this error can be ignored.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Battery and Battery Charger Query test (#5), you may also clear errors generated from other tests in the testing sequence.

Table 660: System Technician-Demanded Tests: POWER

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery and Battery Charger Query test (#5)	X	X	ND
AC Power Query test (#78) (a)	X	X	ND
Power Unit Query test (carrier E) (#127) (b)	X	X	ND
Power Unit Query test (carrier D) (#127) (b)	X	X	ND
Power Unit Query test (carrier A) (#127) (b)	X	X	ND
Power Unit Query test (carrier B) (#127) (b)	X	X	ND
Power Unit Query test (carrier C) (#127) (b)	X	X	ND
Emergency Transfer Query test (#124) (c)	X	X	ND
Cabinet Sensors Query test (#122) (d)	X	X	ND
External Alarm Lead Query test (#120) (e)	X	X	ND

1 of 2

Table 660: System Technician-Demanded Tests: POWER

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Ring Generator Initialization test (#117) (f)	X	X	ND
Analog Ring Generator Query test (#118) (f)	X	X	ND

2 of 2

1 D = Destructive, ND = Nondestructive

Notes:

a See AC-POWER on page 183 for a description.

b See CARR-POW (Carrier Power Supply) on page 578 for a description.

c See EMG-XFER (Emergency Transfer) on page 885 for a description.

d See CABINET (Cabinet Sensors) on page 564 for a description.

e See EXT-DEV (External device alarm) on page 966 for a description.

f See RING-GEN (Analog Ring Generator) on page 1587 for a description.

Battery and Battery Charger Query Test (#5)

This test queries the PN's Maintenance circuit pack for the status of the battery pack and battery charger, and reports the result. During this test, the status LED on the battery charger is lit and extinguished if the status of the battery charger is reported as normal. This event is a result of checking that the battery charger is connected.

Table 661: Test #5 Battery and Battery Charger Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 5

Table 661: Test #5 Battery and Battery Charger Query Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	The battery charger is not connected. If the system has a UPS and no battery charger and batteries, ignore this error since the batteries and charger are not required with certain UPSs. **1** Verify that the battery charger is switched on. **2** Unplug one battery. **3** Switch off the charger and remove its white power cord. **4** Verify that the power cord has at least 106 VAC. **5** Verify that the connector on the rear of the charger is properly inserted. **6** Re-insert the charger power cord and switch on the charger. **7** Plug the battery back in. **8** Run the test environment. The batteries may need charging if it was drained if there were power outages. Reconnect the battery charger to recharge. If Test #5 is run before the batteries are completely charged, the test fails with Error Code 2. If Abort 1005 occurs again, escalate the problem. **9** Wait 30 hours and rerun the test.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 time. **2** If the test continues to ABORT with error code 2000, check for system powering problems with the A carrier. Look for and resolve every AC-POWER and CARR-POW alarm in a multicarrier cabinet system. Repeat the test. **3** If the test continues to ABORT with a 2000 error code, check for and resolve every MAINT (Maintenance circuit pack) error in a PN. Repeat the test.
2029 2319 2320 2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

Table 661: Test #5 Battery and Battery Charger Query Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The system is in nominal power holdover, and the battery is so low that the system will disconnect power very shortly. **1** If power returns, then the port carriers in the PN should power-up again. Every circuit pack should be reinserted, and the system should continue to operate normally. There will probably be a minor alarm against battery and battery charger due to the fact that the batteries are recharging. **2** If power does not return, the system will shut down to prevent damage to the batteries. Restore power, and the system will reboot. *No manual intervention is required.* 3) Rerun the test. If the test still fails, then the PN's MAINT (Maintenance) circuit pack could be reporting this condition incorrectly. Resolve every alarm on this MO, and rerun the test. There are failures that can occur on the PN's Maintenance circuit pack that *will not* be detected by their respective maintenance, but which will cause many, if not every, environment tests to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun.
4	FAIL	The battery is currently being charged. **1** After 30 hours, the battery should be fully charged, and this error should clear.
		2 If after 30 hours the battery is still in the high charge rate, an alarm will be raised. Use **display errors** to see the Error Log, and select the category "environs" to show only environment-related errors. Look for POWER errors of type 257. The first occurrence of this error indicates the time when the battery started charging. Use this time as the starting point to determine whether the battery has been charging for 30 hours. If so, then replace the battery and battery charger. **CAUTION:** Read the section, Replacing the Battery and Battery Charger (J58890CE) on page 1494 before proceeding. 3) Rerun the test. If the test still fails, then the PN's MAINT (Maintenance) circuit pack could be reporting this condition incorrectly. There are failures that can occur on the PN's Maintenance circuit pack that will not be detected by their respective maintenance, but which will cause many, if not every, environment test to fail. If many environment tests are failing, the suspect circuit pack, depending on the system configuration, should be replaced and the test rerun. Resolve every alarm on these MOs, and rerun the test.
6	FAIL	This indicates that error codes 2 and 4 occurred. Refer to these descriptions. Also, refer to this test's description for error code 14.

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Table 661: Test #5 Battery and Battery Charger Query Test

Error Code	Test Result	Description / Recommendation
8	FAIL	For a global AC MCC (J58890CH), use the procedures outlined in step 3. There is a reserve power fault. A problem exists with the battery charger or, less likely, the batteries. Also, this fault could be generated if the charger is switched off or a battery is unplugged. **1** Replace the battery charger and the battery. The fault should disappear. **WARNING:** Always turn off the battery charger before replacing the batteries. **2** Rerun the test. If the test still fails, the PN's MAINT (Maintenance) circuit pack could be reporting this condition incorrectly. Resolve every alarm on this MO, and rerun the test. Some failures on the PN's Maintenance circuit pack are not detected by maintenance, but they cause environment tests to fail. If many environment tests fail, replace the suspect circuit pack and rerun the test. **3** Procedures for a Global MCC (J58890CH): **a** See if any red LEDs are "on" on any of the rectifier modules or the BIU (Battery Interface Unit) located in the Power Distribution Unit (J58890CH). **b** If the BTW (Battery Temp Warning) LED on the BIU is "on," check the batteries for an over temp condition(a.). If temp is normal(a) replace the BIU. If the test still fails, replace the battery in a small battery system. For a large battery system, escalate the problem. **c** If the BNA (Battery Not Available) LED is "on," check the battery connections including connector J20.
8 *(cont'd)*	FAIL *(cont'd)*	**d** If there is an alarm and every LED is OK (PWR OK and BOK) on the rectifier modules and the BIU (Battery Interface Unit), make sure the BIU and the RM0850 rectifiers are seated properly (plugged in). If the BOK LED on the BIU is OK, check the number of rectifiers serving this cabinet: Number of carriers per cabinet / Number of rectifiers per cabinet 1 / 2 2 / 3 3 / 3 4 / 4 5 / 4 If the number of rectifiers is correct replace the maintenance circuit pack in the PN.
10	FAIL	Error codes 2 and 8 have occurred. Refer to these descriptions. Also, refer to this test's description for error code 14.
12	FAIL	Error codes 4 and 8 have occurred. Refer to these descriptions. Also, refer to this test's description for error code 14.

Table 661: Test #5 Battery and Battery Charger Query Test

Error Code	Test Result	Description / Recommendation
14	FAIL	Error codes 2, 4, and 8 have occurred. Refer to these descriptions. This could also indicate that the detection logic on the PN's MAINT (Maintenance) circuit pack is defective. Such an error will not be detected by the respective maintenance. If many environment tests are failing, replace the suspect circuit pack (depending on system configuration).
	PASS	The PN's Maintenance circuit pack has reported that the status of Battery and Battery Charger is good.

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a The equipment must be installed in a well-ventilated area. Maximum equipment performance is obtained at an ambient room temperature between 40 and 120 degrees Fahrenheit (4 and 49 degrees Celsius) for short term operation (not more than 72 consecutive hours or 15 days in a year) and up to 110 degrees Fahrenheit (43 degrees Celsius) for continuous operation.

Battery and Charger for DC-Powered Systems

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
POWER	MINOR	**test environment *UU***	Battery and Battery Charger

1 ***UU*** is the cabinet number indicated in the PORT field from the Alarm or Error Log.

NOTE:
This MO applies to the J58890CE and the J58890CH-1 with large battery holdover.

This MO represents the battery backup unit found in AC-powered multicarrier cabinets. Because the system does not recognize the type of external power, this MO exists in DC-powered multicarrier cabinets but serves no functional purpose. In such cabinets, every POWER test should always pass or abort, and no POWER alarms should be raised.

S8700 Multi-Connect systems support two different types of PN cabinets: multicarrier and single-carrier. Both cabinet types may be powered by either AC or DC external power source. Environmental maintenance differs according to cabinet type and external power supply.

Error Log Entries and Test to Clear Values

Table 662: Battery and Battery Charger Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test environment** *UU* **sh r 1**
1	Any	Battery and Battery Charger Query test (#5) (error code 8)	MINOR	ON	**test environment** *UU* **s r 1**

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Table 662: Battery and Battery Charger Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
257	Any	Battery and Battery Charge Query test (#5) (error code 4)	MINOR	ON	**test environment** *UU* **s r 1**
769	Any	Battery and Battery Charger Query test (#5) (error code 2)	MINOR	ON	**test environment** *UU* **s r 1**
3840 (a)	1005, 1028	Associated Battery and Battery Charger Query test (#5)			**test environment** *UU* **s r 1**

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Note:

a This error is valid only for AC-powered multicarrier cabinets with battery backup. For DC-powered cabinets, ignore the error. It cannot be cleared.

Battery Holdover (Large Batteries)

The large batteries are mounted inside a separate battery cabinet and can supply holdover times of 2 to 8 hours depending on the size of the battery. The batteries are circuit breaker protected and are charged by the J58890CH-1. The batteries also contain a thermal sensor that change the charging voltage depending on the battery temperature.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Battery and Battery Charger Query test (#5), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND*
Battery and Battery Charger Query test (#5)	X	X	ND
AC Power Query test (#78) (a)	X	X	ND
Power Unit Query test (carrier E) (#127) (b)	X	X	ND
Power Unit Query test (carrier D) (#127) (b)	X	X	ND
Power Unit Query test (carrier A) (#127) (b)	X	X	ND
Power Unit Query test (carrier B) (#127) (b)	X	X	ND
Power Unit Query test (carrier C) (#127) (b)	X	X	ND
Emergency Transfer Query test (#124) (c)	X	X	ND
Cabinet Sensors Query test (#122) (d)	X	X	ND
External Alarm Lead Query test (#120) (e)	X	X	ND
Analog Ring Generator Initialization test (#117) (f)	X	X	ND
Analog Ring Generator Query test (#118) (f)	X	X	ND

Notes:

a See AC-POWER on page 183 for a description of this test.

b See CARR-POW (Carrier Power Supply) on page 578 for a description of this test.

c See EMG-XFER (Emergency Transfer) on page 885 for a description of this test.

d See CABINET (Cabinet Sensors) on page 564 for a description of this test.

e See EXT-DEV (External device alarm) on page 966 for a description of this test.

f See RING-GEN (Analog Ring Generator) on page 1587 for a description of this test.

Battery and Battery Charger Query Test (#5)

This test queries the PN's Maintenance circuit pack for the status of the battery pack and battery charger, and reports the result. In a DC-powered system, this test should never fail. During this test, the status LED on the battery charger is lit and extinguished if the status of the battery charger is reported as normal. This event is a result of checking that the battery charger is connected.

Table 663: Test #5 Battery and Battery Charger Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available.
1005	ABORT	Battery charger is not connected. DC-powered cabinets do not have battery backup; ignore this error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2028	ABORT	Internal system error prevented the extinguishing of the Battery Charger status LED. **1** Since this test is not relevant for DC-powered systems, an occurrence of this error indicates possible existence of internal system problems.
2029, 2319, 2320, 2500	ABORT	Internal system error **1** Try the command again at 1-minute intervals up to 5 times.
any	FAIL	The PN's Maintenance circuit pack is incorrectly reporting a problem with power. If this test fails for a DC-powered cabinet, the circuit pack has a problem. Replace the suspect circuit pack, and run the test again.
	PASS	All that can be inferred is that an MCC PN's Maintenance circuit pack is working properly for this test.

POW-SUP (power supply)

G650

MOs name (in alarm log)	Alarm level [1]	Initial SAT command to run[2]	Full name of MO
POW-SUP	WARNING	**test board *location***	Power Supply
POW-SUP	MINOR	**test board *location***	Power Supply
POW-SUP	MAJOR	**test board *location***	Power Supply

1 This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

2 For information on specifying a ***location***, see Command Syntax on page 179.

The MO POW-SUP notes the presence of each power supply and the voltage of each power supply in the G650.

This MO:

- Verifies that a power supply that is administered is physically present
- Verifies that each output voltage (+5V, -5V, and -48V for the power supplies and +12V for the fan) is within tolerance
- Is used with the **recycle carrier** command to momentarily turn off and on the power to a specified power supply or to a specified carrier
- Is used to turn off output voltages from one power supply to verify that the other supply can support the entire load of the G650 (This is used only when a G650 has redundant power supplies.)

There is one instance of this MO for each 655A power supply equipped in a G650 or G650 stack. Refer to Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 for further information.

If you have redundant power supplies, and both are operating, you can unplug one power supply and leave it unplugged for ten minutes without causing an alarm. If the remaining operating power supply has an alarm, the system does not wait ten minutes to generate an alarm. It gnerates an alarm immediately. If the power supply is unplugged for more than ten minutes, the system generates a warning alarm with an error code 23. If you need the power supply to be unplugged for more than ten minutes, and you do not want the system to generate an alarm, use the change circuit pack command to unadminister the power supply.

Recycle carrier (demand only, Test#1534)

The **recycle carrier** command is useful for three different troubleshooting actions:

1 To verify that a redundant power supply can carry the full load. This is done by issuing the SAT command **recycle carrier *CabCarrierSlot*** with the slot number of the power supply that is to be momentarily shut down.

Each power supply monitors the voltage on the backplane and not the voltages from the power supply itself. Therefore, when redundant power supplies are present, the only way to check the voltages from each power supply is to use the recycle power supply command with the slot number chosen to force the other power supply to be tested when it is the only supply on the backplane.

2 To momentarily shut the power off for an entire carrier to force all the boards in the carrier to be power cycled. This is done by issuing the SAT command **recycle carrier *CabCar***.

NOTE:
When redundant power supplies are present, this test may generate error log entries for either power supply in the carrier.

3 To momentarily shut the power off for a control carrier to force the EPN to go down and back up with a COLD restart. This is done by issuing the SAT command **recycle carrier *CabCar*** override for a G650 carrier with an active IPSI.

For the case where duplicate IPSIs are present in a port network, the **set ipserver** command can be used to put an IPSI in the standby mode, so that a recycle of the carrier containing that IPSI will not cause a reset of the EPN.

The following test results may be obtained from the **recycle carrier** command:

Failure Code	Description
1	Output voltages for the power supply under test are out of tolerance after the power was restored.
2	When redundant power supplies are present, the output voltages for the other power supply are out of tolerance after the power was restored.
16	When redundant power supplies are present, and the slot number is specified, the output voltages for the other power supply are out of tolerance during the time that power supply is the only power supply providing power. If it is acceptable to disrupt service temporarily, remove the good power supply and run **test board** for the other power supply to verify that it has failed.

NOTE:
It is unlikely that failure codes 1 or 2 will occur when redundant power supplies are present, because each power supply is measuring the backplane voltage instead of the power supply voltage.

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level [1]	On/Off board	Test-to-clear value
1 (a)	Any	Power supply detection test (#1535)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
23 (b)	—	Power supply recycle test (#1534)	WARNING	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
257 (c)	—	Power supply recycle test (#1534)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
513 (d)	—	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
769 (e)	—	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
1025 (f)	—	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
1281 (g)	—	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
1537 (h)	Any	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**

Error type	Aux data	Associated test	Alarm level [1]	On/Off board	Test-to-clear value
1793 (i)	Any	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**
2049 (j)	—	Power supply voltage test (#1536)	MAJOR/MINOR	ON	**test environment *location*** **test board *location*** **recycle carrier *location* [*slot*][override]**

1 This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

Error Notes:

a **Error type 1**—The power supply was not detected.

b **Error type 23—**The power supply is administered, but not present. Verify that the power is plugged in and check the yellow LED to determine that the power is on.

c **Error type 257—**The recycle failed (recycle carrier demand test). Aux Data shows the failure(s), according to the table below (Aux Data values may be added together).

Aux data	Description
1	The power supply under test did not restore power.
2	The other power supply did not restore power.
16	The power supply under load failed when the other power supply was specified in the recycle command.

d **Error type 513—**The +5V is out of tolerance (4.75 to 5.25 v (+/- 5%)). Run **test board *location***. Run **status environment**.

e **Error type 769—**The -5V is out of tolerance (-4.5 to -5.5 V (+/- 10%). Run **test board *location***. Run **status environment**.

f **Error type 1025—**The -48V is out of tolerance (-44.2 to -51.8 V (+/- 8%). Run **test board *location***. Run **status environment**.

g **Error type 1281—**The +12/14V fan voltage is out of tolerance (+11.4 to +15 V) . The nominal +12V is raised to +14V when there is a hot spot warning or fan failure. Run **test board *location***. Run **status environment**.

h **Error type 1537**—There is an internal failure. Run **test board *location***.

Aux data	Description
1	Analog-to-digital converter failure
2	Digital-to-analog converter failure
4	Internal Mux failure
8	EEPROM failure
64	Calibration contents CRC check failure
128	Power supply firmware CRC check failure

i **Error type 1793**—There is an operational failure. Run **test board *location***.

Aux data	Description
1	No AC or DC input
2	The power supply is off because of a system command.
4	Failure, voltage, temperature, or internal status fault

j **Error type 2049**—There is an input power failure. Run **test board *location***. Run **status environment**.

System technician-demanded tests: Descriptions and error codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. When you clear error codes associated with the Power supply recycle test (#1534) you might also clear errors generated from other tests in the testing sequence.

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Power supply recycle test (#1534)	—	—	D
Power supply detection test (#1535)	X	X	ND
Power supply voltage test (#1536)	X	X	ND

1 D = Destructive, ND = Nondestructive

Power supply recycle test (#1534)

Use the power supply recycle test to verify that the redundant power supply (slot 15) can fully support the power load for the G650 or to shut down the power to an entire carrier to force all the circuit boards in the carrier to recycle. This test turns off the DC output voltages for a few seconds and then turns the voltages

back on. This test is run as a scheduled test only if redundant power supplies are present and then only on one power supply at a time. When redundant power supplies are present, this test can generate error log entries for either power supply.

Table 664: Power supply recycle test (#1534)

Error code	Test result	Description and recommendation
1035	ABORT	The port network is not available. **1** Use the **status port-network** command to verify that the network is not up. **2** Look for alarms against EXP-PN, EXP-INT, PK-INT, etc. **3** Use diagnostic procedures for those MOs to clear the problem.
1971	ABORT	The power supply is not detected.
1973	ABORT	The carrier does not contain a redundant power supply.
1997	ABORT	There is an Active Expansion Archangel (EAA) TN2312BP IPSI in the carrier. Recycle the carrier.
2000	ABORT	The response to a query was not received in the time allowed. **1** Repeat the command at one-minute intervals 1 to 3 times.
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. **1** Repeat the command at one-minute intervals 1 to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed—Retry the command.
	PASS	The power supply recycle test passes.
	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Ensure that the board translations are correct. Execute **add ds1** ***UUCSS*** to administer the MAPD interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board re-initializes it. **3** If the board was found to be inserted correctly, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Power supply detection test (#1535)

The power supply detection test verifies that:

- The power supply is detected
- No internal failures are reported
- Input power is present

When redundant power supplies are present, the microcontroller for a power supply may still be powered, even though input power to the power supply is not present.

Table 665: Test 1535 power supply detection test

Error code	Test result	Description and recommendation
1000	ABORT	This is an internal system error.
1035	ABORT	The port network is not available.
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed—Retry the command.
1[1]	FAIL	The system does not detect a power supply. **1** Verify that the power supply is plugged in. **2** Verify that the yellow LED on the power supply is lit and that at leaset one of the two green input power LEDs is lit. • If the yellow LED is OFF and/or the red LED is ON, replace the power supply. • If the green input power LEDs are OFF, check the AC and/or DC input power. **3** Run **test board**. • If the serial bus test fails (Test #1531) and there is more than one power supply in the G650 stack, Test #1531 fails when none of the power supplies can be accessed over the serial bus. Follow the instructions for Serial bus communications test (#1531) on page 1603. **4** Replace the power supply.
2[1]	FAIL	There is an internal failure in the power supply. **1** Refer to POW-SUP Error Code 1537 for more information. **2** Replace the power supply.

1 of 2

Table 665: Test 1535 power supply detection test

Error code	Test result	Description and recommendation
4	FAIL	The power supply has an operational failure. **1** Refer to POW-SUP Error Code 1793 for more information. **2** Replace the power supply.
8	FAIL	There is not input power. **1** Run **test board**. **a** Verify that the `Input Power` field contains dashes. **b** The green power supply LED for AC power and the green LED for DC power should be OFF when Test #1535 fails with an Error Code 8. **2** Verify that input power is present. **a** If input power is present, replace the power supply. **3** The internal AC fuse or DC fuse may be open. This cannot be repaired by the field technician.
	PASS	The power supply detection test passes.
	NO BOARD	Power supply is administered but not detected. **1** Verify that the power supply is plugged in. **2** Replace the power supply.
		2 of 2

1 It is unlikely that these failure codes will occur when redundant power supplies are present because each power supply is measuring the backplane voltage rather than the power supply voltage.

Power supply voltage test (#1536)

The TN2312BP IPSI scans the status of each 655A power supply on the serial bus every 5 seconds. This test returns the status of the most recent scan of the 655A DC output voltages.

Table 666: Test #1536 power supply voltage

Error code	Test result	Description and recommendation
1000	ABORT	There is an internal software error.
1035	ABORT	The port network is not available.
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. **1** Repeat the command at one-minute intervals 1 to 3 times.
		1 of 3

Table 666: Test #1536 power supply voltage

Error code	Test result	Description and recommendation
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed—Retry the command.
1[1]	FAIL	The +5V is out of tolerance. **1** Use the **test board** command to check the voltages. **a** +5V (+/- 5%) (4.75 to 5.25 V) **2** If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands Reference (555-245-101) before executing the **recycle carrier** command. **3** Replace the power supply. **4** If the problem persists, check the backplane for shorts.
2[1]	FAIL	The -5V is out of tolerance. **1** Use the **test board** command to check the voltages. **a** -5V (+/- 10%) (-4.5 to -5.5 V) **2** If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands Reference (555-245-101) before executing the **recycle carrier** command. **3** Replace the power supply. **4** If the problem persists, check the backplane for shorts.
4[1]	FAIL	The -48V is out of tolerance. **1** Use the **test board** command to check the voltages. **a** - 48V (+/- 8%) (- 44.2 to 51.8 V) **2** If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands Reference (555-245-101) before executing the **recycle carrier** command. **3** Replace the power supply. **4** If the problem persists, check the backplane for shorts.

2 of 3

Table 666: Test #1536 power supply voltage

Error code	Test result	Description and recommendation
8[1]	FAIL	The fan voltage is out of tolerance. **1** Use the **test board** command to check the voltages. **a** +12/14 V (+11.4 to +15 V) **2** If redundant power supplies are present, there may be a problem with the backplane. Verify that each power supply can detect the problem by using the **recycle carrier** command, specifying the slot number of the power supply to be shut down. Refer to the notes and cautions for this command in Maintenance Commands Reference (555-245-101) before executing the **recycle carrier** command. **3** Replace the power supply. **4** If the problem persists, check the backplane for shorts.
—	PASS	The power supply voltage test passes.
—	NO BOARD	Power supply is administered but not detected. **1** Verify that the power supply is plugged in. **2** Replace the power supply.
		3 of 3

1 The values of these failure codes might be added together. For example, a value of 3 indicates that both the +5V and the -5V are out of tolerance or a value of 15 indicates that all four voltages are out of tolerance.

PPP-PT (Control LAN Packet/Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
PPP-PT	MAJOR	**test port *location* long**	PPP Port Maintenance
PPP-PT	MINOR	**test port *location* long**	PPP Port Maintenance
PPP-PT	WARNING	**test port *location***	PPP Port Maintenance

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN799DP (**S8100**: TN799) Control LAN (C-LAN) packet port circuit pack provides TCP/IP connection to adjuncts applications such as CMS, Intuity, and DCS Networking. The C-LAN circuit pack has 1 10baseT Ethernet connection and up to 16 DS0 physical interfaces for PPP connections. Multiple C-LAN circuit packs in a system gives additional TCP/IP capacity.

An RSCL (remote socket control link) connects the C-LAN and the media server to pass call-control and other management information. Since one link serves every port on the circuit pack, maintenance of the RSCL is part of the C-LAN circuit pack maintenance.

NOTE:
The TN799DP (**S8100**: TN799) C-LAN circuit pack combines the functions of the PGATE and PI circuit packs into one circuit pack. The PGATE or PI can be used with the C-LAN to create an X.25 to TCP/IP bridge for adjunct and DCS connectivity.

Control LAN Congestion Controls

The switch activates congestion controls on C-LAN when it detects buffers exceeding the threshold. The switch releases the congestion controls when the C-LAN reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises MINOR alarm
Exhausts buffers	Raises MINOR alarm
Ceases for 12 minutes	Retires MINOR alarm

Error Log Entries and Test to Clear Value

Table 667: PPP-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **s**
1 (a)	0	SCOTCH Sync Loop-Around test (#1275)	MINOR	ON	**test port** *UUCSSpp* **l r 3**
257 (b)	0		WARNING	OFF	
513 (c)	0		MINOR	OFF	
769 (d)	0		WARNING	OFF	
1281 (e)	0				
1537 1538 (f)	See note	Session Status test (#1286)	MINOR	OFF	
1793–1920 (g)	See note				
2305–2560 (h)	See note				
2561–2816 (h)	See note				
3329 (i)	35768	TCP/IP Ping test (#1281)	WARNING	OFF	
3585 (j)	0, 1	TDM Loop-Around test (#1285)	MAJOR	ON	**test port** *UUCSSpp* **l r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a **Error Type 001**: SCOTCH Synchronous Loop-around test (#1275) failed.

1. Test the port (**test port *UUCSSpp* long**).
2. See SCOTCH Synchronous Loop-Around Test (#1275) on page 1518 for repair procedures.

b **Error Type 257**: C-LAN port detected overrun or underrun condition that may indicate a hardware problem.

1. Test for hardware problem (**test port *UUCSSpp* long**).
2. See SCOTCH Synchronous Loop-Around Test (#1275) on page 1518 for repair procedures to verify repair.
3. Clear the alarm (**test port *UUCSSpp* long clear**).

c **Error Type 513**: PPP link lost end-to-end connectivity.

1. Test for hardware problem (**test port *UUCSSpp* long**).
2. Run TDM Loop-around test (#1285), and refer to repair procedures if there is a hardware problem.

   If there is no hardware problem, the switch tries to re-establish PPP link.

d **Error Type 769**: Port received an invalid frame, which

- is greater than the maximum length
- contains CRC errors
- violates the link level protocol.

1. Test the port (**test port *UUCSSpp* long**).
2. Refer to TDM Port Loop-around test (#1285) to verify repair.
3. Clear the alarm (**test port *UUCSSpp* long clear**).

e **Error Type 1281**: System software received an indication that the far end has requested a disconnect of a session on this link. This is a log-only error.

f **Error Type 1537, 1538**: Some or all port sessions (sockets) are down:

If the switch indicates that:	Then it:
Some of the sessions are down	Raises off-board WARNING
Every session is down	Raises off-board MINOR alarm

1. Test the port (**test port *UUCSSpp* short**).
2. See Session Status Test (#1286) on page 1521 for repair procedure to verify repair.

g **Error Type 1793-1920**: system software received an indication that a socket was closed due to an error. Error Type indicates the application associated with this socket.

Error Type	Application
1793	Unused
1794	DCS
1795	AUDIX
1796	CMS
1797	ISDN Gateway
1798–1920	Reserved for future

Aux Data indicates the internal application number.

h **Error Type 2305-2816**: System software detected a session is down. Aux Data indicates the session number. These are log only errors. Error types 2305–2560 are for session numbers 1–256. Error types 2561–2816 are for session numbers 257–512.

i **Error Type 3329**: TCP/IP Ping test failed.

1. Test the port (**test port *UUCSSpp* short**).
2. See TCP/IP Ping Test (#1281) on page 1519 for repair procedures.

j **Error Type 3585**: TDM Port Loop-around test (#1285) failed.

1. Test the port (**test port *UUCsspp* long**).
2. See TDM Loop-Around Test (#1285) on page 1516 for repair procedure.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order they appear in the table below.

Table 668: System Technician-Demanded Tests: PPP-PT

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TDM Loop-around test (#1285)		X	D
SCOTCH Synchronous Loop-around test (#1275)		X	D
TCP/IP Ping test (#1281)	X	X	ND
Session Status test (#1286)	X	X	ND
PPP Link Status test (#1279)	X	X	ND

1 D = Destructive, ND = Nondestructive

TDM Loop-Around Test (#1285)

This test is **destructive**.

This test verifies whether the C-LAN PPP port can send and receive data on the TDM bus. This test has a tone generator send tones on a timeslot, and it has a tone receiver receive tones on another timeslot. The tones are looped through the ppp port.

If the received tones:	Then:
Match the tones sent	The test passes
Do not match the tones sent	The test fails

Test failure indicates failure of the

- C-LAN (TN799DP) circuit pack
- TDM bus
- Tone generator / tone receiver circuit pack

Table 669: Test #1285 TDM Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. **1** Determine port status (**status clan-port *UUCSSpp***). **2** Retry the command when the port is idle. The port may be forced to the idle state by executing a **busyout port *UUCSS*** command. **3** Escalate if the problem persists. The **busyout port** command is destructive, causing every call and link associated with the port to be torn down.
1002	ABORT	No TDM bus timeslots available for the test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
1003	ABORT	No more tone receivers idle for use in this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** If this problem persists, reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). **2** If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
	FAIL	Received tones do not match transmitted tones. **1** Retry command at 1-minute intervals up to 3 times. **2** If the problem persists, see TDM-BUS (TDM Bus) on page 1832 and TONE-PT (Tone Generator) on page 1927. **3** If the problem persists, reset the board (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). Repeat the test. **4** If the problem persists, replace the circuit pack.
	PASS	Port connections across the TDM bus function properly.

SCOTCH Synchronous Loop-Around Test (#1275)

This test is **destructive**.

This test verifies the circuit in the datapath of a ppp call. This test fails if the data transmitted on the port does not match the data received in the loop-around mode. Failure of this test indicates a port hardware fault on the circuit pack.

This test aborts if calls are using the port, or if the PPP link associated with the port is connected. To avoid this, first enter **busyout data-module *extension***, or **busyout port *UUCSSpp***, or **busyout link *link#***, which will cause every call and link using the port to be torn down.

Table 670: Test #1275 SCOTCH Synchronous Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use or PPP link is connected. **1** Use **status clan-port *UUCSSpp*** to determine when the port is available for testing. **2** Use **busyout port *UUCSSpp*** to force the port to the idle state. This command is destructive, causing every call and link using the port to be torn down.
1002	ABORT	No TDM bus timeslots available for the test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
1963	ABORT	Firmware indicates that the port is in use or ppp link is connected. **1** Use **status clan-port *UUCSSpp*** to determine when the port is available for testing. **2** Use **busyout port *UUCSSpp*** to force the port to the idle state. This command is destructive, causing every call and link using the port to be torn down.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** If this problem persists, reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). **2** If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.

1 of 2

Table 670: Test #1275 SCOTCH Synchronous Loop-Around Test

Error Code	Test Result	Description / Recommendation
	FAIL	C-LAN circuit pack detected test failure. **1** If the problem persists, reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). **2** If the problem persists, replace the circuit pack.
	PASS	Port circuitry functioning properly.

TCP/IP Ping Test (#1281)

This nondestructive test fails if the endpoint fails to respond. Use this test to check the circuitry in the data path for a peer-to-peer IP layer connection.

Table 671: Test #1281 TCP/IP Ping Test

Error Code	Test Result	Description / Recommendation
1 2 7 11	ABORT	Internal error **1** Retry the command at 1-minute intervals up to 3 times **2** Escalate if the problem persists.
1005	ABORT	Test configuration is incorrect. **1** Verity PPP link is in-service (**status clan-port UUCSSpp** or **status link *n***). **2** Repeat the test. **3** Escalate if the problem persists.
1124	ABORT	ppp link is not enabled. **1** Verify that the ppp link is enabled (**status port *UUCSSpp***, **status link *n***, or **display data-module**). **2** If the link is not enabled, enable the link (**change data-module**). **3** Repeat the test. **4** Escalate if the problem persists.
1125	ABORT	PPP link not in service. **1** Verify whether ppp link is in service (**status port *UUCSSpp*** or **status link *n***). **2** If the ppp link is not in service, release the link (**release link *n*** or **release port *UUCSSpp***). **3** Repeat the test. **4** Escalate if the problem persists.

Table 671: Test #1281 TCP/IP Ping Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received from the C-LAN circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the circuit pack if the other ports on the board are idle (amber LED is off). Reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
1003	FAIL	Ping to the destination failed due to on-board problem. **1** Retry the command at 1-minute intervals up to 3 times. **2** If the problem persists, reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). **3** If the problem persists, re-administer the PPP connection through a different PPP port, if available. **4** If the problem still persists, or if there are no other available PPP ports, replace the circuit pack.
1007	FAIL	Ping to the destination failed due to the destination down. **1** A PPP destination or a component in the path (e.g., DS1 trunk) may be down. Check the status of the destination or other components in the path. **2** If the destination and every component in the path is in-service, ping the PPP destinations (**ping ip-address *xxx.xxx.xxx.xxx***). **3** Escalate if the problem persists.
	PASS	TCP/IP Ping test (#1281) is successful.

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Session Status Test (#1286)

This nondestructive test determines the status of every PPP port session. This test queries the system software on port session status.

If the system software indicates that:	Then the switch:
Every port session is up (ALL UP)	Raises no alarm, or retires alarm
Some port sessions are up (SOME UP)	Raises MINOR alarm
Every port sessions is down (ALL DOWN)	Raises MINOR alarm

Table 672: Test #1286 Session Status Test

Error Code	Test Result	Description / Recommendation
1124	ABORT	PPP link is not enabled. **1** Verify that the ppp link is enabled (**status port *UUCSSpp***, **status link *n***, or **display data-module**). **2** If the link is not enabled, enable the link (**change data-module**). **3** Repeat the test. **4** Escalate if the problem persists.
1125	ABORT	PPP link not in service. **1** Verify whether PPP link is in service (**status port *UUCSSpp*** or **status link *n***). **2** If the PPP link is not in service, release the link (**release link *n*** or **release port *UUCSSpp***). **3** Repeat the test. **4** Escalate if the problem persists.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** If the problem persists, reset the circuit pack (**busyout port *UUCSSpp*, reset board *UUCSS***, and **release board *UUCSS***). **2** If the problem persists, replace the circuit pack.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
1	FAIL	System software indicates at least one PPP link session is down (SOME UP). **1** Isolate downed sessions (**status port *UUCSSpp*** or **status link *n***). Follow actions based on session information.

1 of 2

Table 672: Test #1286 Session Status Test

Error Code	Test Result	Description / Recommendation
2	FAIL	System software indicates every PPP session is down (ALL DOWN). **1** Test the port (**test port UUCSSpp**) to verify the SCOTCH Synchronous Loop-around test (#1275) result. **2** If test passes, wait for system software to indicate ALL UP. **3** If the test fails, check the destination and other components in the path. **4** If the destination and other components in the path are in-service, take action based on session information.
	PASS	Every session up.

PPP Link Status Inquiry Test (#1279)

This nondestructive test determines the state of the PPP link. The test passes only if the link is up.

Table 673: Test #1279 PPP Link Status Inquiry Test

Error Code	Test Result	Description / Recommendation
1124	ABORT	ppp link is not enabled. **1** Verify that the ppp link is enabled (**status port *UUCSSpp***, **status link *n***, or **display data-module**). **2** If the link is not enabled, enable the link (**change data-module**). **3** Repeat the test. **4** Escalate if the problem persists.
1125	ABORT	PPP Link is not in service. **1** Verify whether PPP link is in-service (**status port *UUCSSpp*** or **status link *n***). **2** If the PPP link is not in service, release the link (**release link n** or **release port *UUCSSpp***). **3** Repeat the test. **4** Escalate if the problem persists.
2100	ABORT	Could not locate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.

Table 673: Test #1279 PPP Link Status Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	PPP link is down. **1** Test the port (**test port *UUCSSpp* long**) to verify the SCOTCH Synchronous Local Loop Around test (#1275) result. **2** If the test passes, wait for sessions to come up. **3** If the test fails, check the destination and other components in the path (e.g., DS1 trunks). **4** If the destination and other components in the path are in-service and the test still fails, execute **busyout port *UUCSSpp*** and **release port *UCCSSpp***, and repeat the test. **5** If the test still fails, reset the circuit pack (**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***). Repeat the test. **6** If the problem persists, replace the circuit pack.
	PASS	PPP link is up.

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PR-ADX (Processor Board - AUDIX Port)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PR-ADX	MINOR	**test port long**	Processor Board AUDIX Port

The SSP (Scalable Speech Processor) is located on a “mezzanine” card (CWY1) on the TN2314. The SSP is connected to the Pentium Processor on the TN2314 using a PMC connector. This card provides the signal processing hardware to perform AUDIX functions and integrate announcement functions. Messages are stored on the PC hard disk. No additional AUDIX hardware is required.

Communication Manager supports the SSP by using a virtual board concept to allow for board insertion and maintenance testing.

By default, the CWY1 card is represented as a virtual board in slot 1A12 for AUDIX functions and in virtual slot 1A13 for announcement functions. It supports up to 16 ports that are administered for 2500 sets but used as AUDIX ports. The name of the Maintenance Object for these ports is PR-ADX.

The CWY1 is not a field replaceable unit. If it fails, the TN2314 processor board must be replaced.

WARNING:

When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack.

Error Log Entries and Test to Clear Values

Table 674: PR-ADX Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port PCSS
1(a)		SSP Port Loop-Around Test Failure (#1351)	MINOR	ON	test port PCSS
257(b)		SSP Port Loop-Around Test Failure (#1351)	MINOR	ON	test port PCSS

1 Run the Short Test sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a Error Type: 1 - Error Type 1 occurs when the SSP L.oop-Around Test #1351 fails. This failure may be due to TDM-BUS errors. If TDM-BUS errors exist refer to TDM-BUS (TDM Bus) on page 1832 to diagnose TDM-BUS errors.

b Error Type 257 - Error Type 257 occurs when the port looparound action requested by Test # 1351 fails. Run test 1351 and refer to the repair steps for that test. See SSP-Port Loop Around Test (#1351) on page 1525

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the *SSP CMC Loop Around Test* for example, you may also clear errors generated from other tests in the testing sequence.

Table 675: PR-ADX System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SSP CMC Loop Around Test (#1351)	X	X	ND

1 D = Destructive; ND = Nondestructive

SSP-Port Loop Around Test (#1351)

This is a nondestructive test.

This test is designed to test all SSP port interface mechanisms. It is run in response to background maintenance tests and craft-demanded tests for SSP ports. This test covers hardware/firmware/software for the Time Division Multiplex Bus (TDM), Network Computing Element (NCE), Concentration Highway Interface (CHI), Timeslot Manager (TSM), and the VFM/CornerStone Application Interface Software.

During normal operations:

1. Calls to AUDIX generate a connection request telling the VFM which timeslots the virtual port should listen to and talk on.
2. The VFM allocates (via its concentration highway (CHI) manager) available CHI timeslots and, in turn, requests the MPC860 firmware to ask the timeslot interchanger (TSI) to map the Communication Manager timeslots on the chosen CHI timeslots.
3. The VFM then sends a response to the CornerStone telling it which CHI timeslots the voice for the answered call is on.

During this test, the maintenance software sets up a loop-around connection on the SSP-CMC. The assigned port will be told to transmit a test bit pattern (digital test count) on one TDM timeslot and listen for the same digital test count on another, verifying that the connection is looped and that the test bit pattern (digital test count) is correct.

Table 676: TEST #1351 SSP Port Loop Around Test

Error Code	Test Result	Description/Recommendation
	ABORT	Internal System Error (a)

Table 676: TEST #1351 SSP Port Loop Around Test

Error Code	Test Result	Description/Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be in use. Use the **display port *location*** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the port is in use, it is unavailable for certain tests. Refer to **status ...** commands in Chapter 1, "Maintenance SAT Commands" in *Maintenance Commands Reference (555-245-101)*, for explanations of all possible states. Wait until the port is idle before retesting, then retry the command at one minute intervals a maximum of 5 times.
1001	ABORT	System resources required to run this test are not available; retry the command at one minute intervals a maximum of 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots that are out-of-service due to TDM-BUS errors. Refer to TDM-BUS (TDM Bus) on page 1832 to diagnose TDM-BUS errors. **1** If the system has no TDM-BUS errors and if it is not handling heavy traffic, retry the command at one minute intervals a maximum of 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present, or some tone detectors may be out-of-service. **1** Resolve any "TTR-LEV" errors. **2** Resolve any "TONE-PT" errors. Retry the command at one minute intervals a maximum of 5 times.
1004	ABORT	The port was put in use during the test. The test has been aborted. Use the **display port PCSSpp** to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the port is in use, it is unavailable for certain tests. Wait until the port is idle before retesting. Retry the command at one minute intervals a maximum of 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period. Retry the command at one minute intervals a maximum of 5 times.
2100	ABORT	Could not allocate the necessary system resources for this test. Retry the command at one minute intervals a maximum of 5 times.

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Table 676: TEST #1351 SSP Port Loop Around Test

Error Code	Test Result	Description/Recommendation
Any	FAIL	The test failed for these reasons: • On-board link to CWY1 firmware is not up. • On-board link to CWY1 firmware failed. • Loop around test failed. Retry the command at one minute intervals a maximum of 5 times. **1** If all ports on the board fail, busy out the board and run the board test to see if the CWY1 card on the TN2314 board has failed. Refer to the repair steps in SSP-CMC Diagnostic/Initialization Test (#1350) on page 1541. **2** If the board tests passes and one or more port tests still fail, check for TDM-BUS problems, TONE-PT problems, or ETR-PORT problems. **3** If the test continues to fail, replace the TN2314.
	PASS	The SSP Port Loop Around test passed. All ports are transmitting properly. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times and see if it continues to pass. **2** If complaints still exist, check for TDM-BUS problems. Otherwise, escalate the problem.

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PR-AL-BD (Processor Alarm Board)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PR-AL-BD	None	**test board**	Processor Alarm Board

The Processor Alarm Board is a virtual board that is used by S8100 to provide External Device Alarm contacts to indicate to Communication Manager if there are any non-Communication Manager alarms such as an AUDIX alarm or PC (global) level alarm present. There is no hardware associated with the virtual board. By default, the board is administered in slot 1A11. The MO name for the External Device Alarms is EXT-DEV. For more detailed information about EXT-DEV, see EXT-DEV ADMIN? N (External Device Alarm) on page 969 and EXT-DEV ADMIN? Y (External Device Alarm) on page 972.

Error Log Entries and Test to Clear Values

Table 677: ALARM-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]		Any	Any	Any	test board PCSS
1(a)		None	Minor	ON	
257(b)		Control Channel Loop Around test (#52)	Major	OFF	test board PCSS

1 Run the Short Test sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a Error Type: 1 - The circuit pack was removed by the VFM. This is a software problem. Follow normal escalation procedures

b Error Type: 257 - The code and vintage was not returned from the VFM. This is a software problem. Follow normal escalation procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the Control Channel Local Loop Around Test, for example, you may also clear errors generated from other tests in the testing sequence.

Table 678: Processor Alarm Board (PR-AL-BD) System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)	X	X	ND
NPE Audit Test (#50)		X	ND

1 D = Destructive, ND = Nondestructive

NPE Test (#50)

This test is nondestructive.

The system sends a message to the on-board microprocessor to update the network connectivity translation for all the Network Processing Elements (NPEs) on the circuit pack. This test always returns a PASS for PR-AL-BD since the virtual alarm board has no Network Processing Element. The NPE test is included for the virtual alarm board just to be consistent with standard port board tests.

Table 679: Test #52 Control Channel Looparound Test

Error Code	Test Result	Description/Recommendation
	PASS	Maintenance software always returns PASS since there is no NPE for the virtual alarm board.

Control Channel Looparound Test (#52)

This test is nondestructive.

This test queries the Virtual Fabric Manager for the circuit pack code and vintage of the Virtual Alarm Board and verifies its records.

Table 680: Control Channel Looparound Test

Error Type	Test Result	Description/Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed because the Virtual Manager software failed to return the circuit pack code or vintage. **1** Retry the command for a maximum of 5 times. **2** If the error occurs again, there is a software problem. Follow normal escalation procedures.
	PASS	Communication with the Virtual Fabric Manager is successful.
	EXTRA BD	Follow normal escalation procedures
Any	NO BOARD	Follow normal escalation procedures.

PR-MAINT

(Maintenance Processor)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PR-MAINT	MIN[1]	**test pr-maint**	Maintenance Processor

1 Alarms on the PR-MAINT maintenance objects are indicated by the red LED on the Processor circuit pack.

The TN2314 processor circuit pack combines three major processing functions: A PENTIUM processor executes “software” for co-resident applications such as voice mail, call accounting, and Communication Manager features. The CWY1 DSP card is a second functional block, integrated with the main board, for speech processing. Finally, a MPC860 processor (supported by the PR-MAINT maintenance object) supports the following hardware/firmware components:

- Remote and Environment Maintenance Functions
- Packet Interfaces (one for TDM interface and one for the packet bus interface)
- Tone/clock Functions
- Archangel Functions

The TN2314 processor includes the Pentium (SPE), memory, hard disk, PCMIA interface (for disk backup), environment maintenance, Archangel, clocking, and generation, packet interfaces to the TDM and packet busses, the standard PBX bus interfaces, and PCI bus support.

The packet interface (PKTINT) connected to the TDM bus provides the PRI interface to the SPE (Switch Processing Element) over the TDM bus. The PKTINT connected to the packet bus provides the PRI interface and the TCP/IP interface from the C-LAN (TN2314) to the SPE over the packet bus.

The RM (Remote Maintenance) firmware executing as a module on the MPC860 also serves as a maintenance processor and watchdog for the SPE by monitoring the SPE’s sanity, performing hardware and environment diagnostics, and providing a remote access port if the SPE is down.

The following environment and system functions will be supported by the MPC860 tasking system:

- Remote Maintenance Firmware - is a firmware module running on an MPC860 processor under the VxWorks real-time operating system.
- Sanity Timer - the RM firmware maintains sanity with the SPE (Pentium) using a socket connection on the IML. The SPE expects the RM firmware module to respond to a sanity byte. The SPE expects RM firmware to increment this byte and return it over the socket connection within a limited time.
- Emergency Transfer Switch - a manual or software controlled switch that transfers a set of analog telephones directly through to Central Office trunk lines.
- External Alarm Input Leads - 2 leads indicating a major or minor alarm condition on an external device, e.g., an Applications Processor or UPS (A UPS alarm is always a MAJOR alarm).
- Customer Provided Equipment (CPE) Alarm Device Leads - a relay closure to a customer provided alarm device indicating a system fault condition.

- LEDs - the alarm panel LEDs for Major Alarm, Minor Alarm, and Emergency Transfer State (the Warning Alarm and Alarm Acknowledgment LEDs are removed) are controlled by RM firmware in response to Communication Manager maintenance commands. There is the standard set of red (TN2314 alarm), green (test-in-progress) and yellow (in use) LEDs for indicating the status of the processor board itself. Additional LEDs under firmware control are the green LED for OK-to-remove and clock status (the TN2314 includes the tone/clock functions), and in addition the PCMIA LED for disk access.
- Power/Fan Status input - is an input monitored by RM firmware that indicates the CMC1 cabinet power supply or a cooling fan has failed. In a multiple cabinet system, this lead represents the logical OR'ing of all cabinet power supplies and fans.
- RS-232 external modem - (no internal modem is available on the TN2314 circuit pack). In the event the SPE is down, the RM firmware will terminate the serial port/modem connection for maintenance activities. Another operating mode exists when the RM firmware watches the PC-terminated connection for escape sequences. The escape sequences will be used for BIOS operations such as setup, upgrade, or BIOS boot. An additional use is for running PC Doctor/DOS for diagnosing Windows 2000 problems.
- Voltage and temperature monitoring - the RM firmware has access to a multi-channel ADC (Analog-to-Digital-Converter) for measuring all TN2314 voltages and the temperature at two locations.

Error Log Entries and Test to Clear Values

Table 681: PR-MAINT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1(a)	Any	MTP Reset Test (#101)	MINOR	ON	test pr-maint l
257(b)	Any	MTP Sanity Handshake Test (#106)	MINOR		test pr-maint s/l
1281(c)	Any	Flow Control l		ON	
2049(d)	Any	External Modem Present Test (#230)	MINOR	OFF	test pr-maint
3585(e)		Restart RM Firmware Test (#1354)		MINOR	
3841(f)		Windows 2000 Reboot Test (#1355)		MAJOR	

Notes:

a Error Type: 1 - The MTP Reset Test (#101) has failed. It is possible MPC860 real time limitations are keeping RM from performing diagnostics and communicating quickly enough. Therefore, the test should be attempted more than once. However, if this test does not pass within a few attempts a minor alarm occurs since RM is important for INADs call backup and environment monitoring.

b Error Type: 257 - The MTP Sanity Handshake Test (#106) has failed. RM firmware must be able to monitor the TN2314 environment, make an INADs call if the SPE is down, and communicate alarm conditions to maintenance software.

c Error Type: 1281 - The TCD maintains a counter to control the number of messages it reports. When the counter reaches its threshold, it stops reporting until the counter is reset by maintenance. This ensures that other counters can reach threshold but that maintenance does not get flooded by errors from the drivers. This error counter is for internal software use and its value is not logged by maintenance.

d Error Type: 2049 - The External Modem Present Test (#230) has failed. If the external modem does not respond with a dial tone indication, the external modem test will fail. The external modem test will abort if the modem is busy with legitimate activity.

Since modem availability is critical for INADs, several failures will cause a minor alarm.

e Error Type: 3585 - The Restart RM Firmware Test (#1354) has failed. If the RM firmware module cannot be restarted by maintenance software, the RM restart test will fail. Repeating failures of this counter are serious. Maintenance software will make several attempts to bring RM firmware back before requesting a complete reboot.

f Error Type:3841 - The Restart RM Firmware Test (#1354) has failed several times and a reboot or restart of Communication Manager is requested.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the *MTP Reset Test,* for example, you may also clear errors generated from other tests in the testing sequence.

Table 682: PR-MAINT System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
External Modem Present Test (#230)(a)	X	X	ND
MTP Sanity Handshake Test (#106)	X	X	ND
MTP Reset Test (#101)		X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a This test aborts if an external modem is not administered.

MTP Reset Test (#101)

This test is nondestructive.

This test sends a *RESET RM* message to cause the RM firmware module to reset itself. During the reset, the RM firmware will execute diagnostic tests. The result of the diagnostics will be sent upstream as PASS/FAIL indication.

The reset test will implicitly check the IML socket between the TCD and RM firmware. It will also verify that the mechanism RM firmware uses to handle MTP type messages is functional.

The reset test will fail if:

- The RM firmware fails its diagnostics.

The reset test will abort if:

- The IML link or MTP message handler fail to establish bidirectional communication (upstream and downstream).
- The test has been disabled.
- There are not enough software resources to support the test.

Table 683: TEST #101 MTP Reset Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The requested test did not complete within the allowable time period. **1** Retry the command.
2500	ABORT	Internal system error. **1** Retry at 1-minute intervals a maximum of 5 times.
1196	FAIL	The RM firmware did not respond to being reset. **1** Retry at 1-minute intervals a maximum of 5 times. **2** If the test continues to fail “reset pr-maint restart” to restart RM firmware. **3** If the test continues to fail, replace the Processor circuit pack.
1197	FAIL	The RM firmware was reset, but it responded with a NOT PASS status, indicating that it did not pass initialization correctly. The RM firmware is not functioning correctly. The system continues to function, but environmental monitoring is lost. **1** Retry at 1-minute intervals a maximum of 5 times. **2** If the test continues to fail “reset pr-maint restart” to restart RM firmware. **3** If test continues to fail, replace the Processor circuit pack.
	PASS	The RM firmware was reset, and it passed initialization correctly.

MTP Sanity Handshake Test (#106)

This test is nondestructive.

The MTP Sanity Handshake Test is simply a query from a maintenance process to the RM Firmware. The TDC (Terminal Control Driver) must reply that RM Firmware is maintaining period sanity scans for this test to pass.

Table 684: TEST #106 MTP Sanity Handshake Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The test did not complete within the allowable time period. **1** Retry the command.
1000	ABORT	System software resources required for this test are not available. **1** Retry at 1-minute intervals a maximum of 5 times.
2000	ABORT	The response to the test request was not received within the allowable time period.
2033	ABORT	Internal system error. **1** Repeat the command at 1-minute intervals a maximum of 5 times.
	FAIL	The RM Firmware did not respond to the Sanity Handshake Query. **1** Re-enter command with the ‘‘long’’ option. **2** If the test continues to fail, replace the Processor circuit pack.
	PASS	The RM Firmware is maintaining Sanity with the TCD and the TCD is reporting that sanity is passing.

MTP External Modem Present Test (#230)

This test is nondestructive.

This test will test for the presence of an external modem, and runs only if the channel is idle. The test passes if the modem can detect dial tone and the Communication Manager server can Communicate with the modem.

Table 685: TEST #230 External Modem Present Test

Error Code	Test Result	Description/ Recommendation
100	ABORT	The test did not complete within the allowable time period. **1** Retry the command.
1018	ABORT	The test has been disabled via administration. **1** To enable the test, issue the **change system-parameters maintenance** command, and set the `Test Remote Access Port` field to **y**. **2** Rerun the test.

Table 685: TEST #230 External Modem Present Test

Error Code	Test Result	Description/ Recommendation
1131	ABORT	INADS port is busy because the system is reporting alarms to INADS, or because INADS is dialed into the system. **1** If INADS is communicating with the switch the INADS trunk is working. There is no need to run this test. **2** Or if required. Wait about ten minutes (until the INADS session is terminated) and then re-enter the command.
1000 2033	ABORT	System software resources required for this test are not available. Internal system error **1** Retry at 1-minute intervals a maximum of 5 times.
1050	ABORT	System could not determine if the testing of the INADS port is administered. **1** Enter the **change system-parameters maintenance** command, and verify the entry for the `Test Remote Access Port` field. **2** Retry at 1-minute intervals a maximum of 5 times.
2000	ABORT	MTP did not respond to the test request. **1** Repeat test at 1-minute intervals a maximum of 5 times. **2** Check modem connections, make sure the modem and the correct driver software are installed (within Windows 2000).
2500	ABORT	Internal System software Error **1** Retry at 1-minute intervals a maximum of 5 times.
	FAIL	Modem Test failure. The system is not able to reliably contact INADS with alarm data. However, the system can continue to provide call services. **NOTE:** The fault may be on the Processor circuit pack or the modem may not be installed correctly. Follow these steps: **1** Check modem connections. **2** Check the modem documentation and verify that the modem will pass self test. **3** Check that correct software driver is installed in Windows 2000 OS. **4** If the test still fails replace the TN2314 circuit pack.

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Table 685: TEST #230 External Modem Present Test

Error Code	Test Result	Description/ Recommendation
	PASS	The modem detected dial tone and was able to communicate with the Communication Manager server.
		1 If the system cannot call INADS, or if INADS cannot contact the system, check with the local Central Office for problems with the INADS trunk, and verify that the INADS number is correct. Check the external modems and verify that it is a approved device. An approved modem with factory default settings is expected to work if correct software driver is installed in the Windows 2000 OS.

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PR-SSP (Processor Board - Scalable Speech Processor)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PR-SSP	MAJOR	**test board**	Processor Board Scalable Speech Processor

The SSP (Scalable Speech Processor) is located on a “mezzanine” card (CWY1) on the TN2314. The CWY1 is connected to the Pentium processor on the TN2314 using a PMC connector. This card provides the signal processing hardware to perform AUDIX and integrated announcement functions. Voice messages and announcements are stored on the TN2314 hard disk. No additional AUDIX hardware is required.

The MO name for the SSP card is PR-SSP. The MO name for the AUDIX ports on the SSP card is PR-ADX (Processor Board - AUDIX Port).

Communication Manager supports the SSP by using a virtual board concept to allow for board insertion and maintenance testing. By default, the application dependent on the CWY1 card is located in virtual slot 1A12 for AUDIX functions and in virtual slot 1A13 for announcement functions.

WARNING:

Slots 1A12 and 1A13 both use the CWY1 board connection. Running the test board long on Slot 1A12 will disrupt user AUDIX and announcement services on both 1A12 and 1A13 slots.

Maintenance testing of the PR-SSP MO is handled by the SSP firmware which is managed by the CornerStone application software. Communication Manager requests that the CornerStone application software run board related diagnostic and initialization tests. CornerStone passes the test result back to Communication Manager. Communication to/from CornerStone is via the Virtual Fabric Manager (VFM). Communication Manager uses the information to raise or retire alarms.

The CWY1 is not a field replaceable unit. If it fails, the TN2314 processor board must be replaced.

The technician can fix the condition by logging in as init and issuing the following command: “reset translation-id”. After this command executes, the “save translations” command is used and the system is rebooted to clear the error and reset the alarm condition.

WARNING:

When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya S8100 with the G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack.

NOTE:
Whenever a major alarm is raised on the board, all the ports will be put in the out-of-service state

Error Log Entries and Test to Clear Values

Table 686: PR-SSP Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test board PCSS
1(a)	Any	SSP Board Diagnostic Test Failure (#1350)	MAJOR	ON	test board PCSS
257(b)	Any	SSP Board Diagnostic Test Failure (#1350)	MAJOR	ON	test board PCSS
513(c)		TSM Test (#1358)	MAJOR	OFF	test board PCSS
769(d)	Any	Control Channel Test (#52)	MAJOR	OFF	test board PCSS

1 Run the Short Test sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a Error Type: 1 - A hardware component on the board has failed to pass the on-board diagnostic test. This error occurs when any of the following conditions exist:

- An in-line error of "SSP board diagnostic" was received.
- Demand test of SSP diagnostic-initialization test fails, and the error code indicates a SSP diagnostic problem.
- After the **reset board** command is entered, Communication Manager maintenance requests that CornerStone run the SSP diagnostic/initialization test. If the test result indicates a board diagnostic/initialization failure, this counter is increased by 1. This counter will be decreased by 1 when the test passes and the alarm will be retired.

b Error Type: 257 - The board has failed to pass the initialization part of Test #1350. This error occurs when any of the following conditions exist:

- An in-line error of "SSP board diagnostic/Initialization failure" is detected.
- Demand test of SSP diagnostic-initialization test fails, and the error code indicates a SSP board Initialization problem.
- After the **reset board** command is entered, Communication Manager maintenance requests that CornerStone run SSP diagnostic/initialization test. If the test result indicates a board diagnostic/initialization failure, this counter is increased by 1. This counter will be decreased by 1 when the test passes and the alarm will be retired.

c Error Type: 513 - This error indicates a loss of communication between the VFM and the TSM. This error occurs when any of the following conditions exist:

- An in-line error of "VFM and TSM looses communication" is detected.

- Demand test of TSM test fails.
- After the reset board command is executed, Communication Manager maintenance requests VFM to run the TSM test. If the test fails, this counter is increased by 1. This counter will be decreased by 1 to resolve the alarm when the test passes.

d Error Type:769 - This error indicates that the Virtual Fabric Manager did not respond to a query for the circuit pack code and vintage of the virtual SSP board.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the *Voice and Control Channel Local Loop Around Test* for example, you may also clear errors generated from other tests in the testing sequence.

Table 687: PR-SSP System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Looparound Test (#52)		X	D
TSM Test (#1358)	+	X	ND

1 D = Destructive; ND = Nondestructive

Control Channel Looparound Test (#52)

This test is nondestructive.

This test queries the Virtual Fabric Manager for the circuit pack code and vintage of the Virtual AUDIX Board and verifies its records.)

Table 688: Test #52 Control Channel Looparound Test

Error Code	Test Result	Description/Recommendation
None 2100	ABORT	System resources for this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed because the Virtual Manager software failed to return the circuit pack code or vintage. **1** Retry the command for a maximum of 5 times. **2** If the error reoccurs, there is a software problem. Follow normal escalation procedures.
	PASS	Communication with the Virtual Fabric Manager software is successful.
	EXTRA BD	Follow normal escalation procedures
Any	NO Board	Follow normal escalation procedures

SSP-CMC Diagnostic/Initialization Test (#1350)

This test is destructive.

NOTE:
Before running this test, busy out the SSP-CMC board. Otherwise, this test will abort. However, if this test is triggered by an inline error, maintenance software will busy out the board before running this test.

WARNING:
Slots 1A12 and 1A13 both use the CWY1 board connection. Running the test board long on Slot 1A12 will disrupt user AUDIX and announcement services on both A12 and 1A13 slots.

This test runs the SSP-CMC diagnostic test and initialization tests.

This test is run in response to in-line errors, periodic maintenance, craft demand (test board & reset board command, etc.) and initialization testing for the SSP-CMC.

Communication Manager Maintenance sends a Run Diagnostic Request via the VFM to CornerStone software to run the SSP-CMC diagnostic test.

If CornerStone software detects an error during the diagnostic test, it will send an SSP-CMC diagnostic error message back to Communication Manager via the VFM (It performs no SSP-CMC initialization).

If the diagnostic test passes, CornerStone will automatically try to initialize the SSP-CMC. If CornerStone detects an error during initialization of the SSP-CMC, it will send an SSP-CMC initialization error message to Communication Manager via the VFM. Otherwise, it will send a test pass message back to the Communication Manager.

After testing the SSP-CMC board must be returned to service (When SSP-CMC board is busied out, all the ports on the board will be out-of-service). The only way to return the SSP-CMC board /ports back to the in-service state is to enter the "**release board**" command after the board test passes.

Table 689: TEST #1350 SSP Board Test

Error Code	Test Result	Description/Recommendation
1001	ABORT	System resources required to run this test are not available. Try the approach in Note (a) below.
1015	ABORT	The board is not busied out, the board must be busied out before running this test.
2000	ABORT	Response to the test request was not received within the allowable time period. Try (a).

1 of 2

Table 689: TEST #1350 SSP Board Test

Error Code	Test Result	Description/Recommendation
1	FAIL	A hardware component on the board has failed **CAUTION:** Resetting/replacing the TN2314 processor pack will take the switch out of service. Follow the procedures for replacing the TN2314 processor circuit pack listed in this document. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack. **1** Reset the board using the **reset board 1a 12** command. Try (a). **2** If the test still fails re-seat the TN2314 processor circuit pack and retry step 1. **3** If the test still fails replace the board and re-run all tests.
2	FAIL	The circuit pack has failed initialization **1** (See recommendations for Error Code 1 Fail).
	PASS	**2** All tests pass

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Note:

a Retry the command at 1-minute intervals a maximum of 5 times. Escalate if the problem persists.

TSM Test (#1358)

This test is destructive.

This test verifies that the Time Slot Manager (TSM) can communicate with the Virtual Fabric Manager (VFM). This verification is done by checking for time-outs and errors in the commutation's between the TSM and the VFM).

In this test, Communication Manager sends a down link message to check the sanity of TSM. The VFM then checks to see whether the communications link between the VFM and TSM has been established.

If the communication link is established between VFM and the TSM firmware, the VFM informs Communication Manager that the test passes.

If the communications link is not up, VFM restarts the TSM through the module manager and waits a time for it to come up. When VFM resets the TSM, all the existing phone calls will be torn down. If the TSM comes back then VFM sends a “pass” test result to Communication Manager. Communication Manager will restore all the administered port states back to whatever it was before the test, except those in-service ports, which will be put into idle state. If the TSM doesn’t come back, then VFM sends a “failure” test result to Communication Manager. Communication Manager will put all the administered ports into out-of-service state

Table 690: TEST #1358TSM Test

Error Code	Test Result	Description/Recommendation
	ABORT	Internal System Error. Try the approach in Note (a) below.
1000	ABORT	System resources required to run this test are not available. The port may be in use. Use the **display port PCSSpp** command to determine the voice port extension of the port. Use the **status station** command to determine the service state of the port. If the port is in use, it is unavailable for certain tests. Refer to “Status” commands, in “Maintenance Commands and Trouble-Clearing Aids” for explanations of all possible states.
1001	ABORT	System resources required to run this test are not available; try (a) below.
2000	ABORT	Response to the test request was not received within the allowable time period.

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Table 690: TEST #1358TSM Test

Error Code	Test Result	Description/Recommendation
None	FAIL	The TSM test failed and all ports are out of service. **1** Test all associated ports using the **test port** command. **2** Resolve any problems detected. **3** Execute the **test port** command. If the test still fails wait 1 minute and re-test. **4** If the board still fails run the **status link** command. **5** Resolve any problems detected and re-test. **CAUTION:** Resetting/replacing the TN2314 processor circuit pack will disrupt service. See the TN2314 processor re-placement procedures in this document before proceeding with step 6. **CAUTION:** Replacing the TN 795 processor board can display the translation error message, "TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack. **6** Reset the board using the **reset board** command. **7** If the board still fails replace the board and re-run all tests. See the above **CAUTION**.
	PASS	The TSM test has passed. To be sure that this is not an intermittent problem, repeat this test.

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Note:

a Retry the command at 1-minute intervals a maximum of 5 times. Escalate if the problem persists.

PR-TN-BD (TN2314 Processor/Tone-Clock)

S8100

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
PR-TN-BD	MAJOR	**test tone-clock *PC***	Processor/Tone-Clock
PR-TN-BD	MINOR	**test tone-clock *PC***	Processor/Tone-Clock
PR-TN-BD	WARNING	**release tone-clock *PC***	Processor/Tone-Clock

1 ***P*** is the port network number (1). ***C*** is the carrier designation (A or B).

The tone-clock functions are located on the TN2314 Processor/Tone-Clock circuit pack, and are implemented as a task-based module on the MPC860 processor chip. The tone/clock function shares the processor with many other firmware modules.

When resolving errors/alarms on the TN2314 Processor/Tone-Clock circuit pack, the following should be used also:

- TONE-PT (Tone Generator) Maintenance documentation
- TDM-CLK (TDM Bus Clock) Maintenance documentation
- SYNC (Synchronization) Maintenance documentation

When replacing the Tone Clock (as part of the TN2314 Processor circuit pack), always follow procedures for replacing the TN2314 Processor circuit pack.

WARNING:

When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*. Retry the command and if the test fails, replace the circuit pack.

CAUTION:

Replacing the TN 795 processor board can display the translation error message, “TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available.

Italian Tone Settings

Tone	Default	Old ISPT Value
Dial	Continuous	Cadenced
Confirmation	Cadenced	Continuous

The TN2314 processor tone-clock circuit pack supports the same International changes as the TN780, and in addition allows the customization of up to 24 system tones in order to meet specific country needs. These changes are made using the **change tone-generation** form.

Tone-Clock Yellow LED Patterns

LED Action	Board State	Explanation
flashing yellow 2.7 sec on 300 ms off	active	master, using off-board synchronization source
winking yellow 300 ms off 2.7 sec on	active	master, using its local reference source
steady yellow on	active	board has been reset and is providing clocks, but has not been told which synchronization source to use
double blink yellow 300 ms on, 300 ms off, 300 ms on, 2.1 s off,	active	TN2314 has lost all external references and is in holdover mode

Tone-Clock Replacement

When replacing a Tone Clock (as part of the TN2314 Processor circuit pack), follow the procedures for replacing the TN2314 Processor circuit pack (See Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)*). The carrier must be powered down before the TN2314 is removed and then the carrier must be powered back up after the circuit pack is inserted.

WARNING:

When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*. Retry the command and if the test fails, replace the circuit pack.

CAUTION:
Replacing the TN 795 processor board can display the translation error message, “TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available.

Hardware Error Log Entries and Test to Clear Values

Table 691: Tone-Clock Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test tone-clock PC sh
1(a)	0	Circuit pack removed or SAKI Sanity Test (#53)	MINOR	ON	
257	65535	Control Channel Test (#52)	MINOR	ON	test tone-clock PC r 20
257(b)	Any	None			
1538(c)	Any	None	MINOR	ON	
2049(d)	0	Clock Health Inquiry Test (#46)	MAJOR	ON	
2305(d)	0	Clock Health Inquiry Test (#46)	MAJOR	ON	
2561(e)	Any	None	MAJOR	ON	
3840(f)	Any	None			
3848(g)	0	Clock Health Inquiry Test (#46)			
3872(h)	0	None			
3999(i)	Any	None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a Error Type 1—This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

b Error Type 257—This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

c Error Type 1538— This error type may require a reset of the tone-clock component in the TN2314; therefore, see caution before proceeding. The circuit pack was taken out of service because of an excessive rate of uplink messages. Use **test tone-clock 1a long** to reset the

circuit pack and put it back into service. If the command is not successful, repeat the command 5 more times in 5 minutes increment. If the command failed all 5 times, perform the command reset tone-clock 1a. If the error occurs again within 15 minutes, follow normal escalation procedures.

CAUTION:
Resetting the tone-clock module will disrupt service, e.g. no dial tone.

d Error Type 2049 or 2305—These errors indicate the loss of clock signals from the Tone-Clock.

1. Examine the Hardware Error Log for errors reported against circuit packs especially the TDM-CLK. Follow the repair or replacement procedures indicated for any such errors found.
2. This step may require a reset of the tone-clock; please see caution above before proceeding. If the error is not corrected by resolving errors found in step 1, perform the command reset tone-clock 1a. If the error occurs again within 15 minutes, follow normal escalation procedures.
3. If error 2305 persists, all clock signals were lost.
4. If the error has not been corrected at this point, there is a problem with the TDM Bus. This may include TDM Bus intercarrier cables, Bus terminators, bent pins on the backplane, and errors on any circuit pack. Refer to TDM-BUS (TDM Bus) on page 1832.

e Error Type 2561—This error indicates that a Tone-Clock circuit pack, with a different circuit pack code than required for this system, has been inserted in the port slot as shown in the Hardware Error Log. To resolve this error, refer to the “How to Replace the Processor Circuit Pack” for an appropriate circuit pack code and replace the Tone-Clock circuit pack with a TN2314 Processor/Tone-Clock circuit pack according to the procedures indicated for this system. The meaning of the aux data value is as follows:

1003	Either a TN741 or TN714 Tone-Clock circuit pack (instead of a TN2314) is in the system.

f Error Type 3840—This error is not service-affecting and can be ignored. It indicates that the circuit pack has received a bad control message from the switch.

g Error Type 3848—This error indicates that the Tone/Clock module had a loss of clock. If error 2305 is also logged, see note (d).

h Error Type 3872—These errors indicate this Tone/Clock module had a loss of Data Clocks. This error will impact users on stations connected to Digital circuit packs. These users could be without service. If error 2049 is also logged, see note (d).

i Error Type 3999— indicates that the Tone/Clock module sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, the Tone/Clock module was taken out-of-service due to hyperactivity. If error type 1538 is not present, the Tone/Clock module has not been taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following tables when inspecting errors in the system. By clearing error codes associated with the *SAKI Sanity Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Table 692: System Technician-Demanded Tests: PR-TN-BD

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Sanity Test (#53)		X	D
Clock Health Inquiry Test (#46)	X	X	ND
Control Channel Loop Around Test (#52)	X	X	ND
Tone Generator Crosstalk Test (#90) (b)		X	
Tone Generator Transmission Test (#40) (b)	X	X	
Tone Generator Audit/Update (#41) (b)	X	X	
TDM Bus Clock Circuit Status Inquiry Test (#148) (c)	X	X	
TDM Bus Clock Slip Inquiry (#149) (c)	X	X	
TDM Bus Clock PPM Inquiry Test (#150) (c)	X	X	
TDM Bus Clock Parameter Update Test (#151) (c)	X	X	
Board Type Check Test (#574) (c)	X	X	

1 D = Destructive, ND = Nondestructive

Notes:

a Refer to XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for descriptions of these tests.

b Refer to TONE-PT (Tone Generator) on page 1927 for descriptions of these tests.

c Refer to TDM-CLK (TDM Bus Clock) on page 1847 for descriptions of these tests.

Clock Health Inquiry Test (#46)

This test is nondestructive.

This inquiry reads special data stored in memory to determine if the Tone-Clock had a loss of any of three clock types:

- SYSCLK
- SYSFM
- SYSDCLK

If this data indicates the Tone-Clock has had a loss of any of these clocks, the inquiry reports FAIL. In addition, if TDM-CLK error 1 is at threshold, this test will FAIL. TDM-CLK error 1 indicates a suspect

clock is at the edge of its specified frequency. If the Tone-Clock did not have either a loss of clock or TDM-CLK error 1 at threshold, the inquiry reports PASS.

This is not really a test, in the sense that it simply reports status held by the system, and does not generate new information or raise alarms. If this test fails with no error code, there is at least one Major alarm against the Tone-Clock. If this test fails with an error code of 1, there is at least one Minor off-board alarm against TDM-CLK.

Table 693: TEST #46 Clock Health Inquiry Test

Error Code	Test Result	Description/ Recommendation
	ABORT	Internal System Error. **1** Retry the command at 1-minute intervals for a maximum of 5 times.
none	FAIL	The TN2314 processor/Tone-Clock circuit pack had an apparent loss of clock. One or more of error types 2049, 2305, 3848, and 3872 will appear in the error log. Correct the problem according to the appropriate error log entries.

1 of 2

Table 693: TEST #46 Clock Health Inquiry Test

Error Code	Test Result	Description/ Recommendation
1	FAIL	The Tone-Clock is suspect of having a clock at the edge of its specified frequency. **CAUTION:** Replacing/Reseating the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please proceed this step with caution. Refer to Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)* and Tone-Clock Replacement on page 1546 for more information on replacing the TN2314 Processor /Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*. Retry the command and if the test fails, replace the circuit pack. **CAUTION:** Replacing the TN 795 processor board can display the translation error message, "TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available. **1** Read Caution above. Reseat the board. **2** Run this test 5 more times in 5 minute increments. **3** If the problem persists, replace the TN2314 Processor/Tone-Clock circuit pack.
	PASS	This TN2314 Processor/Tone-Clock circuit pack has not reported a loss of clock.

2 of 2

Control Channel Looparound Test (#52)

This test is nondestructive.

This test queries the TN2314 Processor/Tone-Clock circuit pack for its circuit pack code and vintage and verifies its records.

Table 694: TEST #52 Control Channel Looparound Test

Error Code	Test Result	Description/ Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
	FAIL	The test failed because the circuit pack failed to return the circuit pack code or vintage. **1** Retry the command for a maximum of 5 times. **2** Note this step may require a reseat of the board; see caution below. If the problem continues, reseat the circuit pack. **CAUTION:** Reseating the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please proceed with caution. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*. Retry the command and if the test fails, replace the circuit pack. **CAUTION:** Replacing the TN 795 processor board can display the translation error message, "TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available. **3** Run the test again. **4** If the error occurs again within 15 minutes, follow normal escalation procedures.
	PASS	Communication with this circuit pack is successful.
	EXTRA BD	This result should only appear when more than one circuit pack has been installed. Remove this circuit pack.

1 of 2

Table 694: TEST #52 Control Channel Looparound Test

Error Code	Test Result	Description/ Recommendation
Any	NO BOARD	This is normal if the test is being done when the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the system is not in a stage of booting up. **2** Retry the command at 1-minute intervals for a maximum of 5 times. **3** Note this step may require a reseat of the board; see caution below. If the problem continues, reseat the circuit pack. **CAUTION:** Reseating the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please proceed with caution.

2 of 2

SAKI Sanity Test (#53)

This test is destructive

This test resets the Tone-Clock functions on the TN2314 processor/Tone -Clock circuit pack. It is executed as part of the long test sequence only for the TN2314 Processor/Tone-Clock circuit pack. This test can be executed by either a demand **test tone-clock 1a long** command or a demand **reset tone-clock 1a**.

Table 695: TEST #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals a maximum of 5 times.
1	FAIL	The circuit pack failed to reset.

1 of 3

Table 695: TEST #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
2	FAIL	The circuit pack failed to restart. **1** Execute command again. **2** Note this step may require a reseat of the board; see caution below. If the problem persists, repeat the test 5 times in 5 minute increment. If problem continues, reseat the TN2314 Processor/Tone-Clock circuit pack. **CAUTION:** Reseating the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please proceed this step with caution. Refer to Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)* and Tone-Clock Replacement on page 1546 for more information on replacing the TN2314 Processor/Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ S8100 Media Server with the Avaya™ G600 Media Gateway and the Avaya™ CMC1 Media Gateway, 555-233-146*. Retry the command and if the test fails, replace the circuit pack. **CAUTION:** Replacing the TN 795 processor board can display the translation error message, "TRANS_ID INTERVAL EXPIRATION:xx days when logging into the SAT window. If this occurs, immediately call an Avaya Technical Services Consultant (TSC) to remove the error message. While the switch is in the error condition, the save translations command is not available. **3** If the error occurs again within 15 minutes, follow normal escalation procedures.

2 of 3

Table 695: TEST #53 SAKI Sanity Test

Error Code	Test Result	Description/ Recommendation
	PASS	The circuit pack initializes correctly. **1** Run the short test sequence.
Any	NO BOARD	This is normal if the test is being done when (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals for a maximum of 5 times.

3 of 3

PRI-CDR/SEC-CDR (Call Detail Recording Link)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
PRI-CDR/SEC-CDR	MINOR	**test cdr primary | secondary l**	CDR Link
PRI-CDR/SEC-CDR	WARNING	**test cdr primary | secondary**	CDR Link

The CDR feature records detailed call information about every incoming and outgoing call on specified trunk groups and sends this information to a CDR output device. The two physical links can be administered for connecting external CDR output devices to the system. They are identified as the primary CDR (PRI-CDR) link and the secondary CDR (SEC-CDR) link. The CDR device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack that is administered as a data extension. A CDR device can also be connected through an ADU to a port on TN726B. The CDR link to the processor is through a C-LAN board. For information about C-LAN port connectivity, see CLAN-BD (Control LAN Circuit Pack) on page 599. External CDR output devices include:

- 94A Local Storage Unit (LSU)
- TELESEER CDR Unit
- Call Accounting System (CAS)
- Call Detail Recording Unit (CDRU)
- Printer
- Host computer
- Personal computer (PC)
- Customer-provided equipment

CDR Link Maintenance provides a strategy for maintaining the link between the system and an external CDR output device. The strategy includes a set of tests for periodic diagnosis, detection of errors during normal operation, actions for troubleshooting, and raising alarms for serious problems. CDR Link Maintenance uses a try-and-wait mechanism for maintaining the CDR link. If the CDR link is torn down due to an error, CDR Link Maintenance tries to bring the CDR link up. If the Link Setup fails, CDR Link Maintenance will wait for 30 seconds before the next retry. If the number of retries reaches a threshold (two), a Minor alarm is raised for service attention.

CDR Link Maintenance does not cover the maintenance of the elements composing the CDR physical link:

- External CDR output device
- Data Module (PDM/MPDM/DTDM) and Digital Line Port of TN754 Digital Line circuit pack
- ADU and Data Line Port of TN726B Data Line circuit pack

If CDR Link Maintenance cannot restore the CDR link, the maintenance tests of these individual components of the CDR link must be executed to diagnose faults.

Procedures for Restoring the CDR Link

1. Determine the status of CDR links.

   Enter **status cdr-link** and make sure that the CDR links are not busied out for maintenance. If the link is down, continue to the next step.

2. Where does the CDR link connect to?

   Enter **display system-parameters features** and find out the destinations of CDR links. Continue to the next step.

3. Enter **status data *extension*** and verify whether the data extension is in the in-service/idle state. If the data extension is not available, look for the extension number in the `Alt Name` field of the Hardware Error Log and see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for resolutions.

4. Is the external CDR output device available?

   Make sure that the CDR output device is on-line and ready for service. Check the physical connectivity between Data Module and the CDR output device.

5. If the problem is not found in the above steps, check the C-LAN board for any problems. For description about system port and its connectivity, see CLAN-BD (Control LAN Circuit Pack) on page 599.

When restoring the CDR link it is necessary to execute maintenance test on different objects that comprise the CDR link. It is recommended that you busyout the CDR link before trying to restore the link. When the CDR Link is busied out, then every CDR Link maintenance action is deactivated, and interference to tests of other MOs is prevented.

Error Log Entries and Test to Clear Values

Table 696: CDR Link Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test cdr-link primary | secondary sh**
18 (a)	0	**busyout cdr-link primary|secondary**	WARNING	OFF	**release cd-link primary | secondary**
257 (b)	Any	Link Retry test (#215)	MINOR[2] WARNING	OFF	**test cd-link primary | secondary l**
513 (c)					**test cdr-link primary | secondary**
1025 (d)					
1281 (e)	Any				

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 Minor alarms may be downgraded to Warning alarms based on the value used in **set options**.

Notes:

a The CDR link is busied out. The CDR link is torn down.

b Link Retry test (#215) fails. An error was detected when setting up the link. See the preceding section Procedures for Restoring the CDR Link on page 1557 for resolution.

c The CDR physical link is down for one of the following reasons:

- Cable to the CDR output device is disconnected.
- CDR output device is powered off.
- The data extension where the CDR output device connects to has been busied out or there is a scheduled daily interchange.

Check the connectivity of wire and cable among wall jacket, data module, and the CDR output device. Enter **status data *extension*** and verify that the data extension of the CDR output device is in the in-service/idle state. If the data extension is not available, see Procedures for Restoring the CDR Link on page 1557 for resolution. Use **display system-parameters maintenance** to see the start time of daily maintenance. If the error occurs and is resolved during of daily maintenance, it can be ignored.

d This error indicates that the CDR output device is in an off-line state, (for example, due to paper jam or paper out for a printer device). The CDR link is torn down. Check the CDR output device and act promptly to put it back to on-line state. Enter **test cdr-link primary | secondary** command to set up the CDR link.

e Software detects an overflow of CDR records generated in the switch due to the heavy trunk traffic and low speed CDR output device. If both primary and secondary links are ON, the secondary link is torn down temporarily for two minutes to speed up the output process to the primary link. No action is necessary for this error type.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented when inspecting errors in the system. By clearing error codes associated with the Link Tear Down test (#213), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Link Tear Down test (#213)		X	D
Link Retry test (#215)	X	X	ND

1 D = Destructive; ND = Nondestructive

Link Tear Down Test (#213)

This test is **destructive**.

This test disconnects the existing link between the system and the external CDR output device. If the link has already been disconnected, the test returns PASS. Every resource allocated for a CDR link is released after this test.

Table 697: Test #213 Link Tear Down Test

Error Code	Test Result	Description / Recommendation
40	ABORT	Internal system error.
50	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1010	ABORT	The CDR link has been busied out to out-of-service. **1** Enter the **release cdr-link primary | secondary** command to release the CDR link from busyout state. **2** Retry the **test cdr-link primary | secondary long** command to execute the test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The CDR link is torn down.

Link Retry Test (#215)

This test sends a message to the CDR software process to make a data call to the extension where the CDR output device connects to. If the CDR link is already up, then this test will be passed without making any data call.

Table 698: Test #215 Link Retry Test *1 of 2*

Error Code	Test Result	Description / Recommendation
10	ABORT	Internal system error.
20	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
30	ABORT	Internal system error. **1** See Procedures for Restoring the CDR Link on page 1557 for instructions.
1010	ABORT	The CDR link has been busied out to out-of-service. **1** Enter **release cdr-link primary | secondary** to release the CDR link from busyout state. **2** Retry **test cdr-link primary | secondary long** to execute the test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 698: Test #215 Link Retry Test *2 of 2*

Error Code	Test Result	Description / Recommendation
	FAIL	The CDR link CANNOT be established. **1** See Procedures for Restoring the CDR Link on page 1557 for instructions.
	PASS	The CDR link is up.

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PROC-SAN (Process Sanity Audits)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
PROC-SAN	none	none	Process Sanity Audits

The Process Sanity Audits MO is responsible for monitoring the sanity of software processes in the system. If the Process Sanity Audits MO detects that a process has gone insane (does not respond to a sanity message within an allotted time period), the process will be restarted. If the Process Sanity Audits MO detects that multiple processes (or a single key process) do not respond to sanity messages within an allotted time period, a system recovery action will be initiated.

The Process Sanity Audits MO has no alarms and no tests. Certain errors are logged to the Hardware Error Log for information purposes only.

Error Log Entries and Test to Clear Values

Table 699: Process Sanity Audits Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	none
10 (a)	0	none	none	none	none
204 (a)	any	none	none	none	none

Note:

a These errors indicate that a system recovery action was taken because one or more software processes failed to respond to a sanity audit in a timely fashion. As a result of the recovery action, the system may have temporarily suspended service for a period of time surrounding the error.

PS-RGEN (Power supply ring generator)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
PS-RGEN	MINOR	**test board *location***	Power Supply Ring Generator
PS-RGEN	MAJOR	**test board *location***	Power Supply Ring Generator

1 For information on specifying a ***location***, see Command Syntax on page 179.

The MO PS-RGEN monitors the ringing voltage of each 655A power supply. The TN2312BP IPSI uses the ring detection circuit on the 655A to monitor ring voltage for the G650. When the TN2312BP IPSI is used in an MCC1 or SCC1, the ring detector on the tone clock monitors ringing.

When the G650 is equipped with two power supplies, the 655A power supply on the left (slot 0) is the primary power supply (master) and the 655A power supply on the right (slot 15) is the secondary power supply. In normal operation, the primary 655A provides ringing for the G650. If the primary 655A is unable to provide ringing to the G650 because it has failed or because of a command from the TN2312BP IPSI, the secondary 655A connects ringing to the backplane using an arbitration lead.

Normally the ring voltage LED (#5) on the left power supply is ON and the ring voltage LED on the right power supply is OFF. This changes momentarily when the ringer interchange test is run. The ring voltage LED will only remain lit on the right power supply when there is a power supply failure of the left hand supply or the left hand supply is removed.

Only one 655A power supply provides ringing voltage to the backplane. The other power supply ring voltage output is isolated from the backplane through a relay contact.

Refer to Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 for further information.

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
1	0				
1 (a)	—	Ring generator interchange test (#1539)	MAJOR/MINOR [1]	ON	**test environment *location*** **test board *location* long**

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
257 (b)	—	Ring generator status test (#1540)	MAJOR/MINOR[1]	ON	**test environment** ***location*** **test board** ***location***
512	1				
513 (c)	Any	Ring generator status test (#1540)	MAJOR/MINOR	ON	**test environment** ***location*** **test board** ***location***

2 of 2

1 This is a minor alarm if there is a redundant power supply, and a major alarm if there is only one power supply.

Error Notes:

a **Error type 1—**Ring generator interchange failed. Run **test environment long**. Run **test board long**.

b **Error type 257—**Ring voltage not detected on backplane.

c **Error type 513—**Ring generator operational status failure. Aux Data values give description (values may be added together).

Aux data	Description
1	Overload
2	Shorted
4	Internal fault
8	Commanded off
16	When redundant power supplies are present, the standby ring generator (slot 15) is providing ringing voltage
32	No ringing voltage on backplane

System technician-demanded tests: Descriptions and error codes

Always investigate tests in the order presented in the following table when inspecting errors in the system. When you clear error codes associated with the Ring Generator Interchange Test (#1539), you might also clear errors generated from other tests in the testing sequence.

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Ring Generator Interchange Test (#1539)	—	X	ND
Ring Generator Status Test (#1540)	X	X	ND

1 D = Destructive, ND = Nondestructive

Ring Generator Status Test (#1540)

The ring generator status test verifies that:

1 The power supply ring voltage detector detects the presence of ringing voltage

2 The operational status information from the ring generator does **not** indicate that the generator is:

- Shut down because it has an internal fault or shorted lead
- Active but its output is operating under overload

This test does not fail if the ring selector switch on the 655A power supply is disabled.

Table 700: Test 1539 Ring generator status

Error Code	Test Result	Description / Recommendation
1035	ABORT	The port network is not available.
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. **1** Repeat the command at one-minute intervals 1 to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed—Retry the command.
1[1]	FAIL	The ring generator is active, but overloaded. **1** Run **test board**.
2[1]	FAIL	The ring generator is inactive because of a short. **1** Run **test board**.

1 of 2

Table 700: Test 1539 Ring generator status

Error Code	Test Result	Description / Recommendation
4[1]	FAIL	There is an internal fault in the ring generator. **1** Run **test board**.
8[1]	FAIL	The ring generator is off by command. **1** Run **test board**.
16[1]	FAIL	The ringer on the primary power supply is not active. **1** Run **test board**.
32[1]	FAIL	There is no ringing voltage on the backplane. **1** Run **test board**.
	PASS	The ring voltage was successfully detected.
	NO BOARD	Power supply is administered but not detected. **1** Verify that the power supply is plugged in. **2** If the power supply was already plugged in, replace the power supply.
		2 of 2

1 The values of these failure codes might be added together. For example, a value of 36 indicates that the ringer generator is inactive because of a short and that the ring generator has an internal fault.

Ring generator interchange test (#1539)

The long test sequence causes a ring interchange. However, the short test, which is the default, does not cause a ring interchange.

The ring generator interchange test causes a temporary interchange and is only used if the G650 has redundant power supplies. This test sends a command to the primary power supply in slot 0 to turn off ringing voltage, the ring arbitration lead changes state, and the secondary power supply in slot 15 provides ringing voltage to the backplane. The ring detection circuit for the secondary power supply is checked to verify that the secondary power supply is providing ringing voltage.

A command is sent to the primary power supply to apply ringing and the ring arbitration lead changes back to allow the primary power supply to provide ringing voltage. The ring voltage detection circuit on the primary power supply is checked to verify that the primary supply is applying ring voltage.

Table 701: Test #1540 Ring generator interchange

Error Code	Test result	Description and recommendation
1000	ABORT	This is an internal system error.
1035	ABORT	The port network is not available.
		1 of 2

Table 701: Test #1540 Ring generator interchange

Error Code	Test result	Description and recommendation
2028	ABORT	There is a problem communicating with the environmental maintenance firmware.
2100	ABORT	The system could not allocate resources. **1** Repeat the command at one-minute intervals 1 to 3 times.
2319	ABORT	The EPN is out of range.
2500	ABORT	An internal operation failed—Retry the command.
1	FAIL	There is no ringing voltage on the backplane when interchanging the ring generator to this power supply. **1** Run **test board**.
	PASS	The ring generation on redundant power supplies is successfully interchanged.
	NO BOARD	Power supply is administered but not detected. **1** Verify that the power supply is plugged in. **2** If the power supply was already plugged in, replace the power supply.
		2 of 2

RANL-STA (Remote Analog Line (Station) Port

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
RANL-STA	MINOR	**test port *location* l**	Remote Analog Line Port
RANL-STA	WARNING	**test port *location* sh**	Remote Analog Line Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

A per-port instance of this MO (RANL-STA) is used to maintain the circuitry associated with a port which has been translated as analog station. The combo blade circuit board has the capability of having two instances of this type of MO.

Failures of the neon message waiting lamp power and the common ringing application circuitry are reported as part of common port circuit pack errors; see errors 1281 and 1793 in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

Ringing Caused by Maintenance Testing

Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, disable it in the `Tests` field of the ***change station extension*** screen. This also disables Test 35 on that station.

Error Log Entries and Test to Clear Values

Table 702: Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	40960 40975 40977	none			
15 (b)	Any	Audits and Updates test (#36)			
18	0	**busyout station *extension***	WARNING	ON	**release station *extension***
257 (c)	40973	none			
513 (d)		Station Present test (#48)	WARNING	OFF	**test port** *UUCSSpp* **sh r 2**
769		Battery Feed test (#35)	MINOR WARNING[2]	ON	**test port** *UUCSSpp* **sh r 2**
2817 (e)		Hyperactive	MINOR	OFF	

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

2 Minor alarms on this MO may be downgraded to Warning alarms based on the values used in **set options**.

Notes:

a **Error type 1 —** These are in-line errors and can only be resolved over time.

- 40960 indicates that too many simultaneous incoming ringing attempts were made on this board. Only 4 ports on a board may ring simultaneously. A 5th incoming call will cause an inline error from the board.
- 40975 indicates that the terminal equipment was on-hook when ring-tip was detected during ringing. This usually indicates a failure in the terminal equipment or the type of terminal has a low ringer impedance. Call the terminal equipment and verify that the terminal rings. If the terminal does not ring, then replace it. Otherwise, issue the **test port *UUCSSpp*** command, and follow the procedure for Test #48.
- 40977 indicates that terminal equipment was not connected when ringing was attempted. Run the short test via the **test port *UUCSSpp*** command, and follow the procedure for the results of Test #48.

b **Error type 15 — A** software audit error that does not indicate hardware malfunction. Run the short test sequence, and investigate associated errors.

c **Error type 257 — A**n in-line error and can only be resolved over time. This error indicates that ringing voltage is absent. If only one analog circuit pack in the system has this problem, then replace the circuit pack. If only analog circuit packs on a particular carrier have this error, then the ringing generator may not be connected to this carrier. If analog circuit packs on many carriers have this error, then it is probably a problem with the ringing generator.

d **Error type 513 —** Test #48 may cause some terminal equipment to ring briefly during daily maintenance. If this disturbs the customer or the terminal equipment, disable it by setting the `Tests` field on the ***change station extension*** screen to **n**. On some software releases, this will also disable Tests #7 and 35 (**S8100**: Tests #6, 7, 161, and 35).

e **Error type 2817** — Indicates that the endpoint caused a large number of control channel messages to be sent to the switch within a short period of time (50 or more CCMS uplinks within 10 seconds). The station will be taken out-of-service for 30 seconds due to the hyperactivity. This may be completely normal during heavy traffic periods.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order below when inspecting errors in the system. By clearing error codes associated with the Battery Feed test (#35), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Battery Feed test (#35)	X	X	ND
Station Present test (#48)	X	X	ND
Station Status and Translation Audits and Updates test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

Battery Feed Test (or Port Diagnostic test) (#35)

The battery feed chip provides power to the telephone equipment, signaling, rotary dial pulsing, transmission, and balance. This test checks the signaling and switchhook capabilities of the battery feed chip by terminating the port, applying battery and detecting the resulting current.

Table 703: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. This result is also reported for the system's Music-On-Hold port when it is off-hook, which it usually is. **1** Enter **display port *UUCSSpp*** to determine the station's extension. Enter **status station *extension*** to determine the service state of the port. If the port is in use, wait until the port is idle. **2** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is in use, wait until the port is idle. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 703: Test #35 Battery Feed Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the ***change station*** screen is **y**. **1** Determine why this field has been set to `n` on this station (this may be due to the ringing application test 48, which can be customer or terminal disturbing). **2** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the `Test` field on the ***change station*** screen to **y**.
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using **display port** (the display shows that the port is a TTI port) or **list config** (the display shows a `t` for the port). **2** If the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct for the test, and no action is necessary.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The port's battery feed chip is unable to supply sufficient power to the terminal equipment. This could be a marginal test, and the terminal equipment may be operating satisfactorily. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, determine whether the customer is experiencing problems on this line. Replace the circuit pack only if the customer is experiencing problems.
	PASS	The port's battery feed chip can provide power to the station equipment to detect on-/off-hook, but may not be able to supply power for touch tones. If touch tones are inoperative on this station, then replace the circuit pack because this port is inoperative. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

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Station Status and Translation Audits and Updates Test (#36)

This test updates the analog port's message lamp state (if it has one) and translations with information in the software.

Table 704: Test #36 Station Status and Translation Audits and Updates

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test, and the test was aborted. Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the port is in use, wait until port is idle. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	This does not indicate a hardware problem. The switchhook audit failed. The other updates were not performed because of this failure. This may occur when the audit is performed at the same time the terminal equipment goes off-hook. Use **status station** to determine when the port is available. **1** Retry the command at 1-minute intervals up to 5 times.
5	FAIL	This may be an internal software error. The message waiting lamp update failed. The translation and ringer updates were not performed because of this failure. **1** Retry the command at 1-minute intervals up to 5 times.
7	FAIL	The translation update failed. There may be an internal software error. The ringer update was not performed because of this failure. **1** Retry the command at 1-minute intervals up to 5 times.
8	FAIL	This does not indicate a hardware problem. There may be an internal software error. The ringer update failed. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The software and the port processor have the same status. User-reported troubles on this port should be investigated by using other port tests, by examining station wiring, or by examining the station.

Station Present Test (or Ringing Application Test) (#48)

This test applies momentary ringing voltage to the terminal equipment and monitors resulting current flow to determine whether the terminal equipment is connected to the port. The test may cause some terminal equipment to ring briefly during daily maintenance. If this ringing disturbs the customer or the terminal equipment, disable it via the `Tests` field on the **change station** screen. However, on some software releases, Test #35 is disabled.

Table 705: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is in use. Wait until the port is idle. **1** Retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test, and the test was aborted. Use **display port *UUCSSpp*** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is in use. Wait until the port is idle. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The test was aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, the modem pool member or Music On Hold).
1008	ABORT	Could not allocate a ringing circuit. Either every ringing circuit is in use, or the ringing generator is defective or incorrectly wired. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or incorrectly wired (see errors for RING-GEN). If it does not occur on other ports, then all four ring phases are in use.
1018	ABORT	The test has been disabled by administration. The default for the `Test` field on the ***change station*** screen is **y**. Determine why this field has been set to **n** on this station (this may be due to the brief ringing disturbance that this test may cause). **1** To enable the test for the particular analog station being tested, enter **change station *extension*** and set the `Test` field on the ***change station*** screen to **y**.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 705: Test #48 Station Present Test

Error Code	Test Result	Description / Recommendation
	FAIL	The terminal equipment is not connected to the circuit pack. Some terminal equipment, such as modems, may fail even when connected properly. **1** Remotely test the equipment. **2** If the test fails again, look for RING-GEN errors in the error log. If present, see RING-GEN (Analog Ring Generator) on page 1587. **3** Check all of the wiring between the station equipment and the switch. Then, run the test again. **4** If the test still fails, the set may be defective. Check the set and replace it, if necessary. **5** Some terminal equipment could fail even when it is connected properly. If so, enter **change station *extension*** and set the `Test` field to **n** to disable the test. This also disables Test #35 on this port.
	PASS	The station is connected properly. This test may also pass if no terminal equipment is connected and the terminal is located very far from the switch. Investigate user-reported troubles on this port by using other port tests, examining station wiring, or examining the station.

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RDIG-STA (Remote Digital Station)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
RDIG-STA	MINOR	**test station *location* l**	Remote Digital Station
RDIG-STA	WARNING	**test station *location* sh**	Remote Digital Station

1 For information on specifying a ***location***, see Command Syntax on page 179.

A per-port instance of this MO (RDIG-STA) is used to maintain the circuitry associated with a port which has been translated as a digital station (or DCP Console). The combo blade circuit board has the capability of having 24 instances of this type of MO.

Remote Digital Station maintenance software provides maintenance for a port administered as a digital station on the circuit pack. This strategy covers the in-line errors log, initialization tests, periodic tests, craft-demanded tests, and alarm resolution and escalation. Each port, translated as a digital station on a digital line board, is running as a separate MO (RDIG-STA) of this type. Fault conditions discovered on one MO may or may not indicate faults on other MOs of the same type.

Maintenance testing for the port circuitry on the combo blade circuit packs is handled by on-board firmware and media server-controlled tests. Maintenance software queries the firmware for error and alarm information, status, and test results. Firmware automatically reports in-line error conditions, which results in media server-controlled testing.

There are instances where the service state of a station is mentioned. The different service states that apply to a remote digital line station are as follows:

Table 706: Remote Digital Line Station Service States

Out-of-Service	The port, and thus the station, have been removed from service. Busyout puts the port in the out-of-service state.
Ready-for-Service	The port on the circuit pack has been put into service, but the voice terminal has not yet established signaling communications with the port.
In-Service	The voice terminal has established signaling communications with the port, and the system is ready to process calls to and from that station. A terminal in the ready-for-service state will progress to the in-service state if it is functioning normally. It can also be forced into the in-service state by going off-hook.

Downloading of Terminal Parameters

Programmable Terminals

The following information describes how maintenance software interacts with terminal parameter downloading.

Terminal Types

- **a** 84xx multibutton digital voice terminals (8403D01A, 8410B, 8410D02A, 8434D01A) with optional expansion module.
- **b** 603A1 and 603D1 Callmaster terminals for telemarketing applications.
- **c** 302B1 and 302C1 attendant console.
- **d** **S8100**: 64xx can receive terminal parameters.

Downloadable Terminal Parameters

The following parameters are downloaded to programmable terminals:

Table 707: Parameters Downloadable to Programmable Terminals

Parameter	Scope	Terminal
International Flags (A-/mu-law, display mode, DLI voltage level)	System level	84xx, 603x, 302B1
Primary Levels (transmission and sidetone)	System level	84xx, 603x, 302B1
Adjunct Levels (transmission and sidetone)	System level	84xx
Handset Expander Option	System level	84xx
Administrable Options (speakerphone and mute button)	Per-terminal	84xx (**S8100**: 64xx)
Administrable Softkeys	Per-terminal, system level	8410D, 8434D

Nonvolatile Memory

Nonvolatile memory stores downloadable parameters in programmable terminals. Once the terminal is downloaded, it is not be necessary to download it again, even if power is removed from the terminal. If nonvolatile memory fails with power still present, the terminal reverts to its default factory settings except for its A-law/mu-law companding settings which are stored in RAM. If power is removed after the nonvolatile memory fails, the terminal reverts to its factory default settings.

NOTE:
The mu-law companding mode is assigned as a default setting at the factory. For the United States, a programmable terminal can place calls even though it has not been downloaded from the system.

Download Actions

There are several different scenarios which causes a terminal to be downloaded. These can occur as part of background maintenance activity or on demand from the SAT (System Access Terminal) or from a station.

For the background actions described below, the terminal downloads automatically if a download retry flag for the terminal is set in software. This flag is set at the time translation is loaded at boot time, when the translation that affects the parameters of a terminal is changed as part of system administration actions, or when a port is inserted in software as a result of board insertion or translation change.

Automatic Download Actions

1 System Reboot/Restart

A global download action is initiated when periodic maintenance tests begin after a system reboot/restart, regardless of whether the parameters have been downloaded previously.

2 Periodic tests

If the download flag is still set when periodic tests are run on a terminal, a download action occurs. This action is required in case a terminal could not be downloaded previously, because the terminal was off-hook when the:

- system first booted

  or

- translations associated with downloadable parameters were changed.

NOTE:
It may take more than an hour for periodic tests to reach the terminal that needs to be downloaded.

3 Terminal Administration

A downloadable terminal is *automatically* downloaded when translation changes associated with downloadable parameters are made as part of system administration. As shown in the previous table, these changes can be for a specified terminal or may be system-wide. If the change is for a system-level parameter, a background global update request must be submitted to download every programmable terminal.

NOTE:
This global update may take more than an hour for a system with several thousand programmable terminals.

4 Port Insertion

Whenever maintenance software initiates a request to place a port into service, a terminal download action is begun on that terminal, if that terminal is programmable. This port insertion action occurs under the following circumstances:

- A digital line circuit pack that is physically inserted into the system and has ports currently administered for programmable terminals.
- A station port is added to the system by **add station** or **change station**.
- A TTI port is activated.

5 Audits

As part of periodic maintenance, the Hardware Status Audit test queries programmable terminals to determine which levels and/or options are being used. If the reported values are not equal to the administered values, the system will initiate a terminal download action; however, this audit does NOT check the parameters used for softkeys.

6 Activation of TTI

A terminal is downloaded automatically when it is activated using the TTI (Terminal Translation Initialization) feature. Therefore, no special user actions are required for TTI.

NOTE:
Plugging the station cord into a terminal does not automatically cause the terminal to be downloaded. If this terminal has factory defaults or if the terminal has been previously downloaded with parameters different than those desired, use one of the demand download actions described below to download the terminal.

Demand Download Actions

1 Busyout/Release Command

A maintenance demand busyout/release request for a station will cause the terminal to be downloaded regardless of its previous download status.

2 Feature Access Code

A Refresh Terminal Parameters Feature Access Code can be used to request a terminal download action. When this code is followed by a "#", the programmable parameters for the current terminal are downloaded when the terminal goes on-hook. When this code is followed by an extension, the programmable parameters for the specified station are downloaded.

This Refresh Terminal Parameters Feature Access Code is assigned on the third page of the **change feature-access-codes** screen.

A confirmation is returned if the download request is accepted. A busy tone is returned if the request is made from a different station when the target station is off-hook.

As a result of an entry of a Refresh Terminal Parameters Facility Access Code, the first three green call appearance LEDs on the 84xx 603x terminal are turned on for three seconds, if the station was successfully downloaded. This is not true for the 302B1 terminal.

There is no visible display on a station for the other background or demand download actions. As described below, use **status station** and **status attendant** to check the download status of a specified terminal.

Status of Parameter Downloads

The **status station** and **status attendant** screens display the current download status of individual 84xx, 603, and 301B1 terminals in the `Download Status` field. The possible download states are:

Status	Terminal Download State
Complete	The terminal successfully downloaded sometime in the past.
Pending	The system is waiting to download the terminal. This may require the execution of a background periodic test, which could take more than an hour. As previously described, demand download can also be used to initiate an immediate download.
Not Applicable	Not a programmable terminal.

Possible reasons for no terminal download include:

- Terminal is off-hook.
- Terminal detected a bad checksum.
- Terminal detected a bad or missing EEPROM (refer to hardware error log).
- Terminal is busy programming data from a previous PROGRAM message.
- Terminal is in the Programming Disabled state.
- Terminal is in the Local Program Options mode.
- Terminal is disconnected or out of service (use **status station**).

Table 708: Digital Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port *UUCSSpp* sh r 1**
1 (a)	1 – 20, 40987	None	WARNING	OFF	
18 (b)	0	**busyout port *UUCSSpp***	WARNING	OFF	**release port *UUCSSpp***
257 (c)	40971	None			
513 (d)	0	Station (Digital) Audits test (#17)	WARNING	OFF	**test port *UUCSSpp* sh r 6**
767 (e)	40964	None	WARNING	OFF	
769 (f)	40963, 40988	None	WARNING	OFF	
1025 (g)		None	WARNING	OFF	
1281	Any	Station (Digital) Audits test (#17)	WARNING	OFF	**test port *UUCSSpp* sh r 4**
1537 (h)	40968	None	WARNING	OFF	
2304 (i)		None			
2305 (j)	32770, 40967	None			
2817 (k)		Hyperactive	MINOR	OFF	
3840 (l)	40965, 40989	None			
3841 (m)	41029	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

Notes:

a **Error type - 1**; **with Aux Data of 40987 —** Could be caused by a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move the voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

Error Type - 1; with Aux Data of 1 to 20 — Occurs when at least 15 off-board problems have been detected with the link to the terminal. When an error with the link is detected, an on-board counter is incremented.

The user could experience a noisy port or link. This is an off-board problem detected by the port circuit. Check for defective wiring, a defective voice terminal, or move the voice terminal closer to the switch (in terms of feet of wire from the jack to the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

b **Error Type - 18 — L**ogged when the port in question is busied out by maintenance personnel. Make sure the port is released from busyout by the **release port *UUCSSpp* | *PCSSpp*** command.

c **Error Type - 257** — Indicates problems transmitting to the voice terminal, which can be caused by defective wiring. Defective wiring can cause varying degrees of problems on different types of sets.

d **Error Type - 513 — T**he result of an ID Request failure to respond to the digital endpoint audit.

e **Error Type - 767 — A**n in-line event produces this error type when a favorable response is received from running the Digital Line Electronic Power Feed test (#11). No craft action is necessary. This alarm will be resolved with the passing of time.

f **Error Type - 769; with Aux Data 40963** — The result of an unfavorable response to the Electronic Power Feed/ Positive Temperature Coefficient test (#11).

Error Type - 769; with Aux Data 40988 — Indicates that the EPF/PTC circuit has been turned off due to an overcurrent condition.

Once the problem has been resolved, it may take up to one hour for the alarm to clear due to the “leaky bucket” strategy. If the problem cannot be resolved by one of the steps above, then replace the circuit pack.

g **Error Type - 1025 — A** problem with the voice terminal EEPROM. When the voice terminal is repaired the alarm will be resolved with the passing of time.

h **Error Type - 1537 —** An in-line maintenance error has generated an off-board warning due to a problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected, check for defective wiring, check for a defective voice terminal, and move the voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

i **Error Type - 2304 —** Internal system error. No action is necessary.

j **Error Type - 2305; with aux data 32770 — In**dicates that the station went off-hook while it was in the ready-for-service state. Use the **status station** command to determine the state of the station. The off-hook should have moved the station to ready-for-service. No craft action is necessary.

Error Type - 2305; with aux data 40967 — Indicates that an in-line maintenance error has generated an off-board warning due to a problem with the link to the voice terminal. This can be ignored if no user complaints are received. Otherwise, make sure the voice terminal is connected,

check for defective wiring, check for a defective voice terminal, and move the voice terminal to a jack that is closer to the switch (in terms of feet of wiring between the jack and the switch). If the problem persists, replace the circuit pack. Once the problem has been resolved, the alarm disappears after a predetermined amount of time.

k **Error Type - 2817** — Indicates that the endpoint caused a large number of control channel messages to be sent to the switch within a short period of time (50 or more CCMS uplinks within 10 seconds). The station will be taken out-of-service for 30 seconds due to the hyperactivity. This may be completely normal during heavy traffic periods.

l **Error Type - 3840; with aux data 40965 — I**ndicates that no terminal is connected to the COMBO board. No maintenance action is required. This is also the code that is generated when the link between the circuit pack and the voice terminal is successfully reset. No craft action is necessary.

Error Type - 3840; with aux data 40989 — Indicates an uplink message has been logged indicating that the Electric Power Feed (EPF) is on with no load on it. No action is necessary. No craft action is necessary.

m **Error Type - 3841 —** The circuit pack's message buffer is full. This may be caused by having many display phones with heavy traffic connected to the circuit pack. No action is necessary.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. For example, by clearing error codes associated with the *Digital Line Electronic Power Feed test (#11)*, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Digital Line Electronic Power Feed test (#11)		X	ND
DIG-LINE Station Lamp Updates test (#16)	X	X	ND
Station (Digital) Audits test (#17)	X	X	ND

1 D = Destructive; ND = Nondestructive

Digital Line Electronic Power Feed/Positive Temperature Coefficient/PPF Test (#11)

This is an Electronic Power Feed (EPF) restoration test. In this test, the processor requests that the EPF be turned on for a given port, and an attempt is made to turn on the power supply to the station. If no current is drawn, the station is probably not connected. If an overcurrent condition is sensed, there may be a short in the loop. A message is returned reporting that either the EPF was successfully turned on, or that an overcurrent condition was sensed. This test is repeated again 5 seconds later.

Table 709: Test #11 Digital Line Electronic Power Feed Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Enter **display port *UUCSSpp*** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **1** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Electronic Power Feed test passed. The message to turn on the power to the station was successfully sent to the port. **1** Although this test will never actually return a FAIL result except for the Internal system error described above, it will log an error indicating the real results of the test. Check the Error Log for any entries with Error Types 767 or 769 after the test completes. **2** If Error Type 767 appears in the Error Log, the test sensed no problems with the power to the station. To verify that the station is powered up correctly, run a self-test on the station and verify that every feature button is operating. **3** If Error Type 769 appears in the Error Log, this indicates some problem with the power to the station. Check for a short in the wiring, a damaged jack, a defective voice terminal, or an incorrect type of terminal.

DIG-LINE Station Lamp Updates Test (#16)

This test lights every lamp on the terminal as specified. The lamp updates will run only if the station is in-service. The status of the station is checked and the lamp updates are blocked from taking place, if the station is not in the in-service state. This test does not affect the status of the Message Waiting lamp.

Table 710: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 710: Test #16 DIG-LINE Station Lamp Updates Test

Error Code	Test Result	Description / Recommendation
1	ABORT	This port may have been busied out by system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error type is present, then release the port using **release station *extension*** and run the test again. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
3	ABORT	Station may be in ready-for-service or out-of-service state. **1** Use the **status station** command to verify the state of the station. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. Use **display port *UUCSSpp*** to determine the station extension or attendant number of the port. Use **status station** or **status attendant** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. Attendants are always in use (off-hook) if the handset is plugged in and the port is not busied out. **1** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1392	ABORT	The port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using **display port** (the display shows that the port is a TTI port) or the **list config** (the display shows a `t` for the port). **2** If **list config** or **display port** indicates that the port is *not* a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The message to light every station lamp was sent successfully to the port. **1** Observe the station lamps being lit when running the test. If every lamps does not light, the other Digital Line test results may indicate related problems that do not allow the lamps to light. **2** Investigate by using other Digital Line port tests, and by examining the station, wiring, and connections.

2 of 2

Digital Station Audits Test (#17)

This is a series of six tests that are classified as audits. The media server sends messages to the on-board microprocessor to perform the tests. These audits run only if the station is in-service.

- Switchhook Inquiry test — This updates the media server's records according to the circuit pack's records. This inquiry is sent all the way to the voice terminal.

- Bad Scan Inquiry test — This sends an up-link message containing a generated count based on certain events relating to the link's conditions. This indicates communications problems between the media server and Digital Port circuit pack.
- EPF/PTC Inquiry test — This sends an up-link status message of the Electronic Power Feed (EPF). Possible conditions are: EPF-on-ok, EPF-off.
- ID Request test — This sends a status request to the station. The station returns its configuration information and health information. The information is checked, and a pass/fail result is provided.
- Ringer update — This updates the digital telephone's ringer state according to the media server's records.
- DTMF Administration update — This sends the digital station a message to refresh its default value (sending touch tones only) in the primary information channel. This value is initially set when the station is put in-service and each time the station's state changes from another state to in-service.

Table 711: Test #17 Station (Digital) Audits Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Switchhook audit timed out. **1** Make sure voice terminal is connected and repeat test. **2** If test fails, replace voice terminal and repeat test.
2	ABORT	ID request fails, health bit returned from voice terminal is bad. **1** Make sure voice terminal is connected and repeat test. **2** If test fails, replace voice terminal and repeat test.
3	ABORT	The EPF has detected an overcurrent condition. **1** Use **test *UUCSSpp* long**. If Test #11 passes, then the EPF condition was cleared. Rerun the short test sequence. If Test #11 does not pass, follow the repair procedures described for Test #11. **2** Look for Error Type 769 logged against RDIG-STA, and follow the procedures in the associated footnote. If any additional problems are found, rerun the test.
4	ABORT	Internal system error **1** Resolve any outstanding circuit pack maintenance problems. **2** Retry the command at 1-minute intervals up to 5 times.
5	ABORT	Ringer update aborted due to station being in ready-for-service or out-of-service state.
6	ABORT	This port may have been busied out by a system technician. **1** Look in the Error Log for Error Type 18 (port busied out) for this port. If this error is present, use **release station** to release the port. **2** Make sure that the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 711: Test #17 Station (Digital) Audits Test

Error Code	Test Result	Description / Recommendation
1392	ABORT	This port is currently a TTI port and the test will not execute on it. **1** Verify that the port is a TTI port using **display port**, where the display shows that the port is a TTI port, or **list config**, where the display shows a `t` for the port. **2** If **list config** or **display port** indicate that the port is not a TTI port, escalate the problem. If both commands indicate that the port is a TTI port, the abort is correct, and no action is necessary.
2000	ABORT	Response to the test was not received in the allowable time period.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Station audits passed. This Digital Port circuit pack is functioning properly. **1** If complaints persist, investigate by using other port tests, and by examining the station, wiring, and connections.

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REM-OFF (Remote Office)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
REM-OFF	MINOR	**ping node-name *node-name* | ip-address *location***	Remote Office
REM-OFF	WARNING	**ping node-name *node-name* | ip-address *location***	Remote Office

1 For information on specifying a ***location***, see Command Syntax on page 179.

An instance of this MO (REM-OFF) is associated with every Remote Office box that is administered on the switch. This MO monitors keep alive and periodic PING test failures, and if these errors occur, they are logged against this MO.

Error Log Entries and Test to Clear Values

Table 712: Analog Line Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)		A ping test to an endpoint has failed.	MINOR	OFF	**ping node-name** *node-name* | **ip-address** *addr*
257 (b)	See note (b)	A keep-alive update request has exceeded the time limit for an endpoint.	Log only	OFF	**ping node-name** *node-name* | **ip-address** *addr*

Notes:

a **Error Type - 1** — Indicates that a PING test to the Remote Office has failed, and a MINOR alarm has been raised.

The PING test verifies that a path to a registered Remote Office is good. When this error is logged, as many as 26 endpoints (associated with that Remote Office) and several H.323 signaling groups could be out of service.

b **Error Type - 257** — A Keep-Alive Timer is set for every registered endpoint on the Remote Office. The switch expects keep-alive update information within a certain time period. If that time limit is exceeded, an error is logged. The error is a log-only error, because there is no way to determine which entity has failed.

The aux data associated with this error indicates whether the endpoint that failed to respond was a DCP, Analog, or Signaling Group type. Aux data with a value of:

- 1096 = Analog Line
- 1095 = DCP Line
- 6179 = H.323 Signaling Group

System Technician-Demanded Tests: Descriptions and Error Codes

There are no demand tests for this MO. Use **ping ip-address | node-name** to pin the Remote Office.

RING-GEN (Analog Ring Generator)

S8700 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
RING-GEN	MAJOR	**test environment *P***	Analog Ring Generator

1 ***P*** is the port network's number indicated in the PORT field from the Alarm or Error Log.

Analog phones must be provided with a voltage that allows them to ring. The Analog Ring Generator MO represents the device that provides the ringing voltage for every analog phone associated with a given cabinet. In a multicarrier cabinet, the ring generator resides in the power distribution unit. It is protected by a fuse located next to the main circuit breaker on the front of the unit. In single-carrier cabinets, the ring generator is part of the WP-91153 power supply. **S8100**: The Analog Ring Generator is part of the 650A AC Power Supply.

Failure of the ring generator results in loss of ringing on analog phones. Ringing on digital and hybrid phones is not affected.

The ringing voltage is monitored by the Tone-Clock circuit pack. In a port network with duplicated Tone-Clocks, the active Tone-Clock performs this function. In a PN made up of single-carrier cabinets, the Tone-Clock monitors the ringing voltage of only the carrier where it resides.

The TN2036 Voltage Range circuit pack provides easy access for testing the various voltages on the backplane pins.

Error Log Entries and Test to Clear Values

Table 713: Analog Ring Generator Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test environment** *UU*
1		Analog Ring Generator Query (#118)	MAJOR	ON	**test environment** *UU* **r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description and follow its procedures.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. For example, by clearing error codes associated with the Analog Ring Generator Initialization test (#117), you may also clear errors generated from other tests in the testing sequence.

Table 714: Multicarrier Cabinet

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Ring Generator Initialization test (#117)	X	X	ND
Analog Ring Generator Query test (#118)	X	X	ND
Battery and Battery Charger Query test (#5) (a)	X	X	ND
AC Power Query test (#78) (b)	X	X	ND
S8700 MC: OLS Query test (Carrier E) (#127) (c)	X	X	ND
S8700 MC: OLS Query test (Carrier D) (#127) (c)	X	X	ND
S8700 MC: OLS Query test (Carrier A) (#127) (c)	X	X	ND
S8700 MC: OLS Query test (Carrier B) (#127) (c)	X	X	ND
S8700 MC: OLS Query test (Carrier C) (#127) (c)	X	X	ND
S8700 MC / **S8100**: Emergency Transfer Query test (#124) (d)	X	X	ND
Cabinet Sensors Query test (#122) (e) (**S8700 IP**: (d))	X	X	ND
External Alarm Lead Query test (#120) (f) (**S8700 IP**: (e))	X	X	ND

1 D = Destructive, ND = Nondestructive

Notes:

a See POWER on page 1493 for a description of this test.

b See CARR-POW (Carrier Power Supply) on page 578, (**S8700 IP**: or RMC-ENV (Power/Fan Sensors) on page 1593) for a description of this test.

c See EMG-XFER (Emergency Transfer) on page 885 for a description of this test.

d SeeCABINET (Cabinet Sensors) on page 564 for a description of this test.

e See EXT-DEV (External device alarm) on page 966 for a description of this test.

Table 715: Single-Carrier Cabinet

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Analog Ring Generator Initialization test (#117)	X	X	ND
Analog Ring Generator Query test (#118)	X	X	ND
Single-Carrier Cabinet Power Query test (#79) (a)	X	X	ND
Emergency Transfer Query test (#124) (b)	X	X	ND
External Alarm Lead Query test (#120) (c)	X	X	ND

1 D = Destructive, ND = Nondestructive

Notes:

a See DC-POWER for a description of this test.

b See EMG-XFER for a description of this test.

c See EXT-DEV for a description of this test.

Analog Ring Generator Initialization Test (#117)

The Analog Ring Generator Initialization test sends a request to the active TN768, TN780, TN2182 Tone-Clock or TN2312AP IPSI circuit pack's Tone-Clock circuit to monitor the voltage. The Tone-Clock responds with an error if the ringing voltage falls too low.

Table 716: Test #117 Analog Ring Generator Initialization Test

Error Code	Test Result	Description / Recommendation
1 1000 1001 1003 1115 2012 2100	ABORT	The system software is unable to determine the active Tone-Clock circuit pack, unable to allocated the resources necessary to run the test, or unable to send a down link message. **1** Wait for the green LED on the active Tone-Clock to go out. **2** Use **status port-network** to determine the active Tone-Clock circuit pack. **3** Rerun the test. If the test aborts again, see TDM-CLK (TDM Bus Clock) on page 1847.
2000	ABORT	Response to the request was not received within the allowable time period. **1** Look for TDM-CLK errors and alarms. Resolve every other Tone-Clock problem first. **2** Rerun the test.
S8100: 1005	ABORT	The tone/clock is unable to read the analog ringing voltage level when the tone/clock is in the Processor Interface slot. This test is not available for the Processor Port Network in this configuration.
	PASS	The active Tone-Clock has successfully been enabled to monitor the ringing voltage level.

Analog Ring Generator Query Test (#118)

The Analog Ring Generator Query test requests the active Tone-Clock circuit pack to check the ringing voltage. The Tone-Clock circuit pack replies with PASS if the ringing voltage is adequate to ring the analog phones. If not, the active Tone-Clock circuit pack replies with a FAIL.

Table 717: Test #118 Analog Ring Generator Query Test

Error Code	Test Result	Description / Recommendation
1 1000 1001 1003 1115 2012 2100	ABORT	Could not seize the resources to run the test. Other maintenance is running on the active Tone-Clock circuit pack. **1** Wait for the green LED on the active Tone-Clock circuit pack to go out. **2** Use **status port-network** to determine the active Tone-Clock circuit pack. **3** Rerun the test. If the test aborts again, see TDM-CLK (TDM Bus Clock) on page 1847.
2000	ABORT	Response to the request was not received within the allowable time period. **1** Look for TDM-CLK errors and alarms. Resolve every other Tone-Clock problem first. **2** Rerun the test.
S8100: 1005	ABORT	The tone/clock is unable to read the analog ringing voltage level when the tone/clock is in the Processor Interface slot. This test is not available for the Processor Port Network in this configuration.
	FAIL	The ringing voltage is below acceptable levels. For a multicarrier cabinet system: **1** If this is a duplicated system, use **status port-network** to determine the active Tone-Clock circuit pack. **2** Use **set tone-clock *PC*** to make the standby Tone-Clock circuit pack active **3** Rerun the test. **a** If the test passes, the trouble is with the now standby Tone-Clock circuit pack. See TONE-BD (Tone-Clock Circuit) on page 1902 for details on replacing the standby Tone-Clock circuit pack. After the circuit pack is replaced, use **set tone-clock *PC*** to make this Tone-Clock active again, and rerun the test. **b** If the test fails: **4** Resolve CARR-POW alarms first, and then rerun the test. **5** Check fuse on the power distribution unit. Replace if it is open, and rerun the test. If the test still fails, then an analog line circuit pack could be defective and causing the ring generator and/or fuse to fail. **6** Unseat every analog circuit pack in the affected cabinet, and rerun the test. **7** If the test passes, then the ring generator is healthy, and one of the analog circuit packs is defective. Replace the analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. When the defective analog circuit pack is found, replace it and rerun the test. If the test still fails, proceed with Step 6.

Table 717: Test #118 Analog Ring Generator Query Test

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	**8** Since the test still fails, the ring generator is defective. **a** If the reset button on the ring generator is out, press it in. **b** Originate calls to several analog stations on different port circuit packs in different carriers in the affected port network. **c** If called stations ring, the fault is cleared. Proceed to Step d. If no stations ring, replace the ring generator. **d** Rerun the test. If the test still fails, proceed to Step 7. **9** The active Tone-Clock may be faulty and incorrectly reporting the level of the ringing voltage. Replace the active Tone-Clock, and rerun the test. See TONE-BD (Tone-Clock Circuit) on page 1902 for details on replacing the Tone-Clock. Rerun the test. Procedure for a **single-carrier** cabinet system: This failure indicates that there is no ringing voltage in the carrier where the active Tone-Clock circuit pack resides. Other carriers may or may not have ringing voltage. **1** If this is a duplicated system, use **status system** to determine the active Tone-Clock circuit pack. Use **set tone-clock *PC*** to make the standby Tone-Clock circuit active, and rerun the test. **a** If the test passes, then the trouble is with the "new" stand by Tone-Clock circuit pack. See TONE-BD (Tone-Clock Circuit) on page 1902 for details on replacing the standby Tone-Clock circuit pack. After the circuit pack is replaced, use **set tone-clock *PC*** to make this Tone-Clock circuit active, and rerun the test. **b** If the test fails, then proceed with Step 2. **2** Unseat every analog circuit pack in the cabinet that contains the active Tone-Clock circuit pack, and rerun the test. **3** If the test passes, then the ring generator is healthy and one of the analog circuit packs is defective. Replace the analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. Replace the defective analog circuit pack. Rerun the test. If the test still fails, go to Step 4. **4** Replace the WP-91153 power unit for the affected carrier, and rerun the test. If the test still fails, go to Step 5. **5** The active Tone-Clock may be faulty and incorrectly reporting the level of the ringing voltage. Replace the active Tone-Clock, and rerun the test. See TONE-BD (Tone-Clock Circuit) on page 1902 for details on replacing the active Tone-Clock circuit pack. Rerun the test.

Table 717: Test #118 Analog Ring Generator Query Test

Error Code	Test Result	Description / Recommendation
S8100	FAIL *(con't)*	This failure indicates that there is no ringing voltage in the carrier where the active tone/clock circuit pack resides. Other carriers may or may not have ringing voltage. **1** Unseat all analog circuit packs in the cabinet that contains the Tone/Clock circuit pack and rerun the test. **2** If the test passes, then the Ring Generator is healthy and one of the analog circuit packs is defective. Replace the analog circuit packs one at a time, and rerun the test to determine which circuit pack is causing the problem. When the defective analog circuit pack is found, replace it. Rerun the test. **3** If the test still fails, go to the next step. **4** Replace the 650A power unit, and rerun the test.
	PASS	The analog ringing voltage level is acceptable. For a single-carrier cabinet stack, ringing voltage is acceptable in the cabinet containing the active Tone-Clock circuit pack.

RMC-ENV (Power/Fan Sensors)

G600 only

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
RMC-ENV	MAJOR	**test environment**	Power/Fan Sensors

The AC Power Supply (650A) for a G600 media gateway (Rack-Mounted Cabinet - RMC) supports one alarm lead that indicates the state of both the power and fan. The cabinets use variable-speed fans to reduce noise. The power unit contains thermal speed control. A 3-pin connector on the variable-speed fan assembly accepts variable input power to control its fan speed and power its alarm circuitry.

Table 718, LED and Alarm Conditions, on page 1593 shows the LED and alarm conditions.

Table 718: LED and Alarm Conditions

Condition	LED Status	Alarm State	Fan/Power Alarm
Normal	Red off, amber on	Open	Normal
No input power	Red off, amber off	Closed	No input power
DC output not present (except neon)	Red on, amber off	Closed	DC output not present (except neon)
Fan alarm	Red on, amber on	Closed	Fan/Power alarm

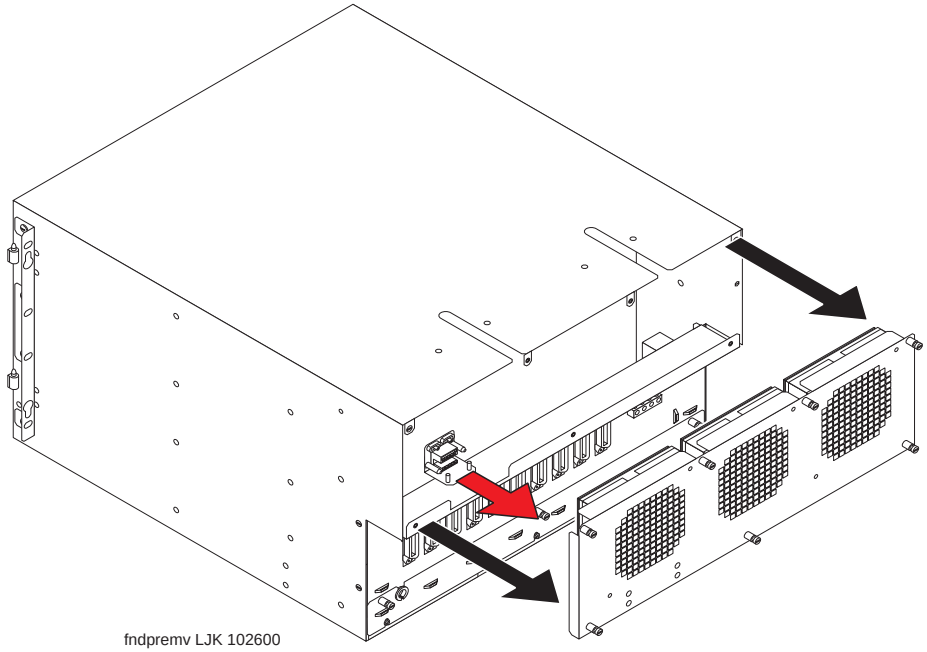
Fan Removal and Replacement

WARNING:

You can remove the fan assembly while the system is running, but you must replace the new assembly within 60 seconds to avoid a thermal overload.

1. Place the new fan assembly close to the G600.
2. Loosen the thumb screws on the fan assembly, and pull it straight out (unplug it) as shown in Figure 117, Fan Removal, on page 1594. The power for the fan automatically disconnects when the assembly is unplugged.
3. Plug in the new fan assembly. The power for the fan automatically connects when the fan assembly is plugged in.
4. Tighten every thumb screw on the fan assembly.

Figure 117: Fan Removal



Hardware Error Log Entries and Test to Clear Values

Table 719: Cabinet sensors error log entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test environment
1(a)	Any	Cabinet Temperature or Voltage Query test (#122)	MAJOR	ON	test environment

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to the test's description and follow the procedures.

Notes:

a Error Type: 1 – The power-/fan-status lead indicates that a G600 media gateway's power supply has detected an alarm condition. The condition can be caused by the failure of any fan's or any power supply's output. If more than one G600 exists, every power-/fan-status lead is tied together. (The fan and power lead is an O-ring of every cabinet's status lead.) Since an error condition on a fan's or power supply's output could be the result of a temporary overload (e.g., during board insertion) or caused by the equipment's location (e.g., fan blockage), a single event may be an anomaly that eventually clears. However, a repeating condition causes a major alarm.

On-Demand Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the following table. For example, by clearing error codes associated with the *RMC Power/Fan Query test*, you may also clear errors generated from other tests in the testing sequence. Test descriptions and recommended maintenance procedures follow for every error that can occur during on-demand testing.

Table 720: On-Demand Tests for Cabinet Sensors

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
RMC Power/Fan Query test (#77)	X	X	ND
Analog Ring Generator Initialization test (#117) (a)	X	X	ND
Analog Ring Generator Query test (#118) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a Refer to ''Analog Ring Generator Initialization Test (#117)'' on page 1493 for a description of this test.

b Refer to ''Analog Ring Generator Query Test (#118)'' on page 1495 for a description of this test.

RMC Power/Fan Query Test (#77)

This test queries the Processor circuit pack for the status of the cabinet sensors in the G600 media gateway (RMC). Only one alarm lead is supported by this cabinet type to indicate a power, temperature, or a fan problem. This means that a failure of this test can also mean a power problem, not necessarily just a temperature/fan problem.

Table 721: TEST #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2029	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.

Table 721: TEST #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
1	FAIL	There is a fan, temperature, power, or voltage problem in one or more of the cabinets. The power supply's LEDs may indicate the problem's source. **1** If none of the fans are running, then: **a** Verify 8- to 14-Volt DC power is available to the fan units by checking the wiring connector. — If there is 8- to 14-Volt DC power at the connector, there should be power to the fans. If the fans still do not run, replace the fan assembly. If not, then the power unit's fan output is defective or thermally shut down. Let the power unit cool, and recycle AC input power. If no fan output, replace the power unit. If the fans still do not run, escalate the problem. **2** If only 1 of the fans is not running, replace the fan. **3** If every fan can be started, wait 5 minutes and rerun the test. If the test fails again, proceed to Step 4 or 5 as applicable. **4** If the fans are not at high speed, measure the cabinet's temperature at the air intake and the air exhaust at the top of the cabinet. **a** If the 5- to 60^0-C criteria is met, there is a problem with the fans that is preventing the fans from operating at high speed. Replace the fans. If the fans run at high speed, wait 5 minutes to give the cabinet time to cool down and, rerun the test. If the problem persists, go to step 5. If not, the Processor circuit pack is incorrectly reporting this condition. Look for and resolve every error on these MOs first, then rerun the test. **5** If the fans are running at high speed, check the items on following list. Any one of these could be restricting or redirecting the cabinet's air flow. **a** Verify that nothing other than circuit packs in the carrier slots that could be restricting air flow. **b** Verify that no circuit-pack blanks or carrier faceplates are missing. Install and/or replace them as necessary. **c** Be sure the cabinet's doors are properly closed. The doors must be closed to enable the fans to properly cool the cabinet. Wait 5 minutes to allow the fans to cool the cabinet. Rerun the test. If the test still fails, proceed to Step 6.

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Table 721: TEST #122 Cabinet Temperature Query Test

Error Code	Test Result	Description / Recommendation
		6 At this point, there should be nothing impeding the air flow, and the fans should be running at high speed. Check the temperatures for the 5- to 60^0-C criteria. **a** If the 5- to 60^0-C criteria exists, a temperature problem exists, and the fans (at high speed) should cool down the switch. Wait 5 minutes, and rerun the test. If the test still fails, the ambient room temperature is probably too high, and the room should be cooled. If not, the fans are defective. Replace the fan assembly, and rerun the test. Failures can occur on the Processor circuit pack that is **not** detected by the respective MO, but that cause many, if not every, environment test to fail. If many environment tests are failing, the suspected circuit pack (depending on the system configuration) should be replaced and the test rerun. There is a problem with the environment of the power system: **1** The power unit for the cabinet may be defective. **a** Verify and, if necessary, replace the power unit. **b** Rerun the test. If the test still fails, escalate.
	PASS	The cabinet does not have a power or fan problem. If a problem is reported, troubleshoot by using the previous procedures for the FAIL cases.

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SER-BUS (Serial communication bus)

G650

MOs name (in alarm log)	Alarm level	Initial SAT command to run[1]	Full name of MO
SER-BUS	MINOR	**test environment *location* sh**	SER communication bus
SER-BUS	MAJOR	**test environment *location* l**	SER communication bus

1 For information on specifying a ***location***, see Command Syntax on page 179.

Each port network of G650s has a Serial Bus that allows the TN2312BP IPSI to talk to the 655A power supplies. This Serial Bus uses 2 previously unused leads in the Universal Port Slot. SPARE3 (pin 055) now becomes serial data. SPARE4 (pin 155) now becomes serial clock. The serial communication bus is a two-wire bi-directional half-duplex bus that is provided on the backplane of the G650. The serial bus consists of a clock line and a data line. Data is transferred on the data line synchronously in bit-serial fashion a byte at a time. Communication on the serial bus is at speeds up to 100 kbits per second.

Older TDM/LAN cables did not have these 2 leads so the G650 required a new TDM/LAN cable. These 2 leads are not terminated on the TDM/LAN Terminators (AHF110). This is an open-collector bus where each power supply and each TN2312BP IPSI provide a pull-up resistor to +5VDC for each of the 2 Serial Bus leads. The bus will have logic pulses extending between 0V and 5V.

The TN2312BP IPSI in the A carrier will act as master of the serial bus and poll each of the power supplies based on their board address. Only a TN2312BP IPSI in the A carrier can be a bus master, even if a TN2312BP in carrier B is used for port network connectivity. Therefore, setting the TN2312BP in the A carrier or B carrier to be active will not clear a problem if the TN2312BP itself is the reason for the failure. The power supplies board address is derived from 4 board address leads in the power slot of the backplane. The G650 carrier addressing paddle card sets 3 of these 4 address leads for the power slot. A G650 can have a maximum of ten 655A power supplies on the serial bus (See Figure 118, Wiring diagram for serial bus data and clock leads, on page 1599).

NOTE:
The serial bus is provided only to a G650 equipped with TN2312BP IPSI circuit packs. The serial bus is not available on any other media gateway.

Figure 119, G650 Cabinet Environmental Hardware Components, on page 1599 illustrates these components.

Figure 118: Wiring diagram for serial bus data and clock leads

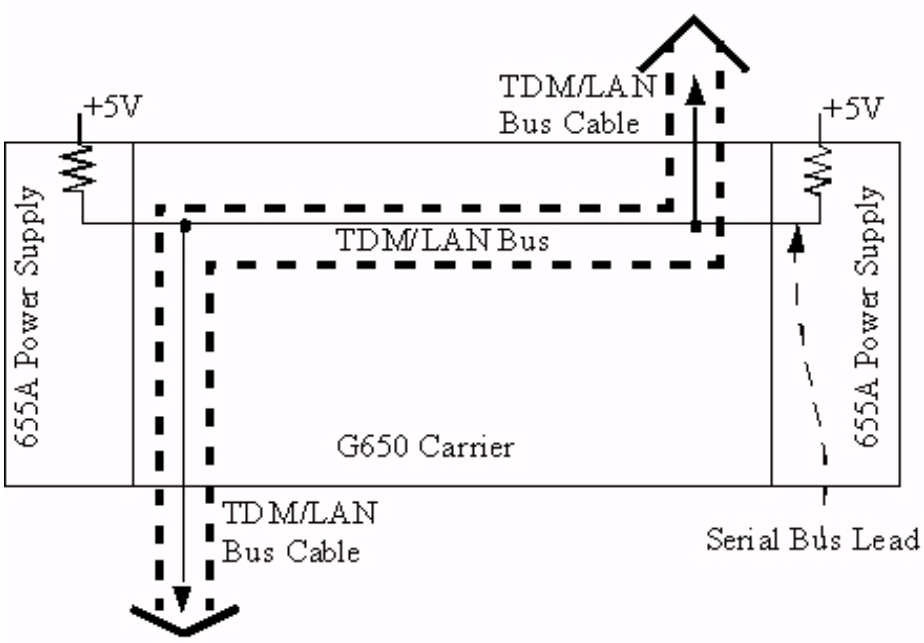
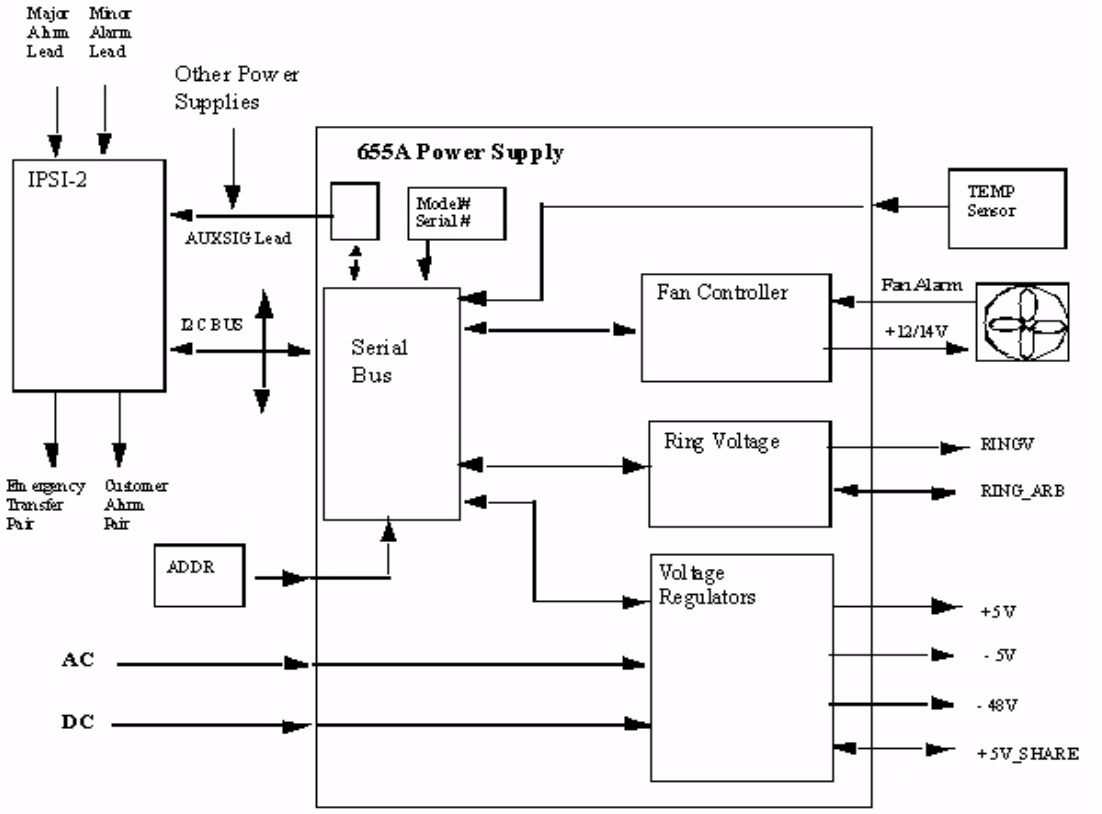


Figure 119: G650 Cabinet Environmental Hardware Components



Use the **status environment** command to obtain the following information:

- Inlet temperature - 655A power supply sensor
- Exhaust temperature - G650 carrier exhaust air sensor
- Hot Spot temperature - 655A power supply sensor
  - — The system generates a warning at 176^{o} Fahrenheit (80^{o} Celsius).
  - — The power supply shuts down at 194^{o} Fahrenheit (90^{o} Celsius).
- Power supply output voltage measurements, +5VDC, -5VDC, and -48VDC
- Fan Control - The speed of the fans, either mid (normal) or high (fan failure or hot spot temperature limit exceeded).
- Fan Alarm - Detection of a blocked or failed fan
- Ring Status - OK, overload, shorted, or failed
- Ring Control - Active, standby, disabled, off (shorted or failed)
- Ringer Setting - 20Hz, 25Hz, or other
- Ring Detection - Reports if power supply detects ring on the backplane ring leads
- Source of input power - AC, DC, or both
- Input power - Indicates the type of power currently in use, AC or DC
- AuxSig signal status

> **NOTE:**
> If the TN 2312BP IPSI cannot get data from the power supplies, the data entries for **status environment** will be dashed out.

Use the **recycle carrier** command to:

- Shut off all voltage output temporarily
- Shut off ringer voltage output temporarily

Use the **clear error** command to:

- Clear the non-volatile source ID cause of the last shutdown
- Clear the serial bus error and time-out counters

Serial Bus Fault Detection and Isolation

Serial Bus faults can be caused by:

- A defective circuit pack inserted into one of the G650 slots
- Bent pins on the G650 backplane
- Defective TDM/LAN bus cables
- Power supply microcontroller failure
- TN2312BP IPSI failure

It is possible that a circuit pack can cause a Serial Bus fault and still exhibit trouble-free operation. For example, insertions of any cicuit pack into a G650 slot may bend the backplane pins and short two leads together. Or a circuit pack that doesn't use the Serial Bus could still have an on board short that shorts

one of the Serial Bus leads. Since the Serial Bus is a shared resource that each circuit pack and power supply has access to, identification of the cause of a Serial Bus fault can be difficult.

WARNING:

Since the Serial Bus fault isolation procedure involves removing circuit packs and possibly disconnecting entire carriers, the procedure is extremely destructive to the port network that is being tested. If possible, arrange to perform this procedure at a time when traffic is minimal.

As circuit packs are removed or entire carriers are disconnected, any active calls terminating on those circuit packs or carriers will be dropped. If you have any hints about a particular circuit pack that may be causing the Serial Bus problem investigate those before performing this procedure (for example, look at any circuit packs that were inserted into the PN just before the Serial Bus problem appeared.) Also examine which power supplies the system is unable to show using **list configuration power-supply *cab*** and concentrate your efforts on those carriers and their cabling.

CAUTION:

When straightening or replacing backplane pins in a carrier, power to that carrier must be shut off. Failure to follow this procedure may result in damage to circuit packs and power supplies, and can be hazardous to the technician.

Procedure 1

The procedure removes and reinserts port circuit packs (those in the purple slots) one or more at a time. Use this procedure for each port circuit pack in the port network until the problem is resolved or until all circuit packs in the port network have been tried.

If the Serial Bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot are causing the problem. If the backplane pins are intact, replace the circuit pack. If some of the tests fail regardless of whether the circuit pack is inserted or removed, and the backplane pins are intact, the circuit pack is not the cause of the problem. In a multiple failure situation, the circuit pack could be one cause of the Serial Bus problem. However, other simultaneous failures might also be responsible for Serial Bus faults. In Procedure 2, an option of working either with one circuit pack at a time or with multiple circuit packs simultaneously is available. In view of this capability, determine the level of service interruption that will be acceptable during the procedure. If causing a disruption to all users in the port network is deemed permissible, large groups of circuit packs should be worked with in order to get the job done quickly. However, if large service disruptions are to be avoided, work with one circuit pack at a time. This option is slower, but it disrupts only the users of a single circuit pack.

Refer to the repair procedure steps given under Serial bus communications test (#1531) on page 1603.

Procedure 2

Procedure 2 attempts to isolate the Serial Bus failure to a particular set of carriers. Only the circuit packs in selected carriers are checked. Procedure 2 is used if the preceding procedure fails, because it can help locate multiple circuit pack failures and failures of the carrier hardware itself. In this procedure, the TDM/LAN Cable Assemblies and TDM/LAN Bus terminators are replaced. If this action does not resolve the Serial Bus fault, the carriers are reconfigured so that certain carriers are disconnected from the Serial Bus. This is done by moving the TDM/LAN Bus terminators (AHF110) on the carrier backplane. To terminate a Serial Bus at the end of a particular carrier, the Serial Bus cable that connects the carrier to the next carrier should be unplugged and replaced with the TDM/LAN Bus terminator. When the length

of the Serial Bus is modified the A carrier TN2312BP IPSI circuit pack that is essential to the Serial Bus operation and Serial Bus maintenance must still be connected to the new shortened Serial Bus.

After cabling changes are made and verified, power must be restored to the port network. Circuit packs in carriers that are not part of the shortened bus are not inserted. As a result, these circuit packs are alarmed. Ignore these alarms for now. All alarms should be resolved when the cabinet is restored to its original configuration.

Procedure 2 is organized into two parts. Part 1 attempts to clear the Serial Bus fault by replacing all the bus cabling and terminators within a port-network. Part 2 attempts to isolate the fault to a particular carrier by extending the Serial Bus from the A carrier to additional carriers one at a time.

Refer to the repair procedure steps given under Serial bus communications test (#1531) on page 1603

Error log entries and test-to-clear values

Error type	Aux data	Associated test	Alarm level	On/Off board	Test-to-clear value
257 (a)	—	Serial Bus Communications Test (#1531)	MINOR	Off	**test environment *location***

a **Error type 257—**Serial bus failure. There are no power supplies detected on the serial bus.

System technician-demanded test: Descriptions and error codes

Order of investigation	Short test sequence	Long test sequence	D/ND[1]
Serial Bus Communications Test (#1531)	X	X	ND

1 D = Destructive, ND = Nondestructive

Serial bus communications test (#1531)

The TN2312BP IPSI requests status information from the power supplies every 5 seconds. If it does not receive a response, or if it does not detect at least one power supply at initialization, it generates a serial bus failure error message.

Table 722: Test 1531 Serial bus status

Error code	Test result	Description and recommendation
1000	ABORT	This is an internal software error. **1** Repeat the command at one-minute intervals 1 to 3 times.
2000	ABORT	The response to a query was not received in the time allowed. **1** Repeat the command at one-minute intervals 1 to 3 times.

1 of 4

Table 722: Test 1531 Serial bus status

Error code	Test result	Description and recommendation
	FAIL	**1** Issue **list conguration power-supply *cab*** and check if any power supplies are detected. **2** Issue **list configuration all** and verify that the carrier locations for the power supplies appear correct. If not, verify that the paddle boards are inserted in the correct position for the carrier location. **3** Use the following Serial Bus repair procedures: ********** **Procedure 1:** This procedure removes and reinserts port circuit packs (those in the purple slots) one or more at a time. Use this procedure for each port circuit pack in the port network until the problem is resolved or until all circuit packs in the port network have been tried. **a** If the Serial Bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot are causing the problem. **b** If the backplane pins are intact, replace the circuit pack. If some of the tests fail regardless of whether the circuit pack is inserted or removed, and the backplane pins are intact, the circuit pack is not the cause of the problem. In a multiple failure situation, the circuit pack could be one cause of the Serial Bus problem. However, other simultaneous failures might also be responsible for Serial Bus faults. However, if large service disruptions are to be avoided, work with one circuit pack at a time. This option is slower, but it disrupts only the users of a single circuit pack. **c** Remove one or several circuit packs as appropriate. Any circuit packs that have been recently inserted should be checked first. If you decide to remove multiple circuit packs, consider working with an entire carrier at a time to more quickly and reliably determine which circuit packs are not the source of trouble. Do not remove the A carrier TN2312BP IPSI as it is the link back to the server. **d** Run **list configuration power-supply *cab*** to determine if some power supplies are still not showing and the Serial Bus fault is still present. **e** If the fault is still present: **1** Check if the backplane pins in the removed circuit pack's slot appear to be bent. **2** If the backplane pins are not bent, reinsert the circuit pack(s), and perform this Procedure 1 for the next set of circuit packs. **3** If the backplane pins are bent, remove power to this carrier in the manner described previously. **4** Straighten or replace the pins and reinsert the circuit pack. **5** Restore power and repeat Procedure 1, beginning with Step 2, for the same circuit pack(s). **f** If the fault is not present: **1** Reinsert the circuit pack(s) one at a time, and repeat the following substeps until all of the circuit packs have been reinserted.

Table 722: Test 1531 Serial bus status

Error code	Test result	Description and recommendation
	FAIL (Cont)	**2** Run **list configuration power-supply *cab*** to determine if the Serial Bus fault has returned. **3** If any of the power supplies don't show, the reinserted circuit pack is defective. Replace this circuit pack and repeat this procedure for the next circuit pack. **4** If none of the power supplies fail to show when all of the circuit packs have been reinserted, the problem has been fixed and the procedure is completed. ********** **Procedure 2:** This procedure attempts to isolate the Serial Bus failure to a particular set of carriers. Only the circuit packs in selected carriers are checked. Procedure 2 is organized into two parts. Part 1 attempts to clear the Serial Bus fault by replacing all the bus cabling and terminators within a port-network. Part 2 attempts to isolate the fault to a particular carrier by extending the Serial Bus from the A carrier to additional carriers one at a time. **WARNING:** Power must be removed from the entire port network before any cables or terminators are removed. Failure to follow this procedure can cause damage to circuit packs and power supplies, and can be hazardous to the technician. **Part 1:** **a** If spare TDM/LAN Cable assemblies and TDM/LAN Bus Terminators are not available, go to Part 2 of this procedure. **b** Power down the port network. **c** Replace all of the TDM/LAN Cable Assemblies and both TDM/LAN Bus Terminators. **d** Restore power to the port network. **e** Run the **list configuration power-supply *cab*** command to determine if the Serial Bus fault is still present. **f** If the Serial Bus fault is resolved, the procedure is completed. Otherwise, go to Part 2. **Part 2:** **a** Terminate the TDM/LAN Bus so that it extends only across the carrier that contains the A carrier TN2312BP IPSI. **b** Determine if the Serial Bus fault is still present by running the **list configuration power-supply *cab*** command. **c** If **list configuration power-supply *cab*** doesn't fail to show any power supplies, extend the TDM/LAN/Serial Bus to another carrier, and repeat the procedure in the previous step. When a carrier that causes the fault to recur is added, perform Procedure 1 for only the

Table 722: Test 1531 Serial bus status

Error code	Test result	Description and recommendation
	FAIL (Cont)	circuit packs in that carrier. **d** If **list configuration power-supply *cab*** fails to show any power supplies, and Procedures 1 and 2 have not resolved the problem, the added carrier(s) are defective and must be replaced. ********** **4** If the Serial Bus repair procedures were unsuccessful, replace the TN2312BP IPSI circuit pack. **5** If all else fails, and there is only one power supply in the system, replace the power supply.
	PASS	At least one power supply responded to a status query from the TN2312BP IPSI.
		4 of 4

S-SYN-BD (Speech Synthesis Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
S-SYN-BD	MINOR	**test board *location* sh**	Speech Synthesis circuit pack
S-SYN-BD	WARNING	**test board *location* sh**	Speech Synthesis circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for errors at the circuit-pack level. See S-SYN-PT (Speech Synthesis Port) on page 1607 for related port information.

S-SYN-PT (Speech Synthesis Port)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
S-SYN-PT	MAJOR	**test port *location* sh**	Speech Synthesis port
S-SYN-PT	MINOR	**test port *location* l**	Speech Synthesis port
S-SYN-PT	WARNING	**test port *location* sh**	Speech Synthesis port

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TN725B Speech Synthesis circuit pack provides four independent Speech Synthesis ports which may be connected to any of the voice time slots on the Time Division Multiplex (TDM) Bus. Each Speech Synthesis port consists of a speech synthesizer device (SSD) and is managed by a custom-coded programmable speech synthesizer (PSS) controller. The PSS controller is, in turn, controlled by the on-board microprocessor via a command interface specifically designed for this application. The PSS controller's main function is the orderly transfer of encoded speech from the speech vocabulary read-only memory (ROM) to the SSDs. The SSDs decode it and produce 64-kbps 5-255 PCM (Pulse Code Modulation) speech. The encoded speech is stored in up to 512 Kbytes of on-board ROM. In addition, each Speech Synthesis port has an associated dual-tone multifrequency receiver (DTMR) to receive touch-tone digits from a station set connected to the port via a voice time slot. The station set may be connected to the Speech Synthesis port through either a line or trunk circuit.

When there is an incoming call to a port, the "listen" network time slot is connected to the DTMF receiver input and the "talk" network time slot is connected to the SSD output. This enables the Speech Synthesis port to support speech synthesis features or touch-tone input with voice response features.

Some of the features that use the Speech Synthesis port's capabilities include Leave Word Calling, Automatic Circuit Assurance, Automatic Wakeup (hotel-motel), and Do Not Disturb (hotel-motel).

The Speech Synthesis circuit pack supports different voice features than ones supported by the Announcement circuit pack.

Error Log Entries and Test to Clear Values

Table 723: Speech Synthesis Port Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
1 (a)	17672	None			
18	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
130 (b)		None	WARNING	ON	**test port** *UUCSSpp* **sh**
257		Speech Synthesis PSS Handshake test (#168)	MAJOR	ON	**test port** *UUCSSpp* **sh r 2**
513	17922	Speech Synthesis Memory test (#166)	MINOR	ON	**test port** *UUCSSpp* **sh r 2**
769	17664	Speech Synthesis DTMF Receiver Inquiry test (#164)	MINOR	ON	**test port** *UUCSSpp* **sh r 2**
1025	17670	Speech Synthesis SSD Inquiry test (#167)	MINOR	ON	**test port** *UUCSSpp* **sh r 2**
1281		Speech Synthesis DSP Tone test (#165)	MINOR	ON	**test port** *UUCSSpp* **sh r 2**
1537		Speech Synthesis Memory test (#166)	MINOR	ON	**test port** *UUCSSpp* **sh r 2**
1793		Speech Synthesis DTMF Receiver test (#163)	MINOR	ON	**test port** *UUCSSpp* **l r 2**
2049 (c)		Conference Circuit test (#7)	MINOR	ON	**test port** *UUCSSpp* **l r 2**
2305		NPE Crosstalk test (#6)	MINOR	ON	**test port** *UUCSSpp* **l r 2**
3840 (d)	Any	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Notes:

a An in-line failure of the on-board microprocessor/PSS handshake has occurred. Refer to Test #168 for repair procedures.

b This error type indicates that the circuit pack been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

c A transient error that does not cause an alarm can occasionally occur during a server, TDM bus, or Tone-Clock interchange. Test the port, and follow the instructions for the Conference test (#7).

d This error is not service-affecting, and no action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk* test (#6), you may clear errors generated from other tests in the sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Speech Synthesis PSS Handshake test (#168)	X	X	ND
NPE Crosstalk test (#6)		X	ND
Conference Circuit test (#7)		X	ND
Speech Synthesis DTMF Receiver test (#163)		X	ND
Speech Synthesis Memory test (#166)	X	X	ND
Speech Synthesis DSP Tone test (#165)	X	X	ND
Speech Synthesis SSD Inquiry test (#167)	X	X	ND
Speech Synthesis DTMF Receiver Inquiry test (#164)	X	X	ND
Speech Synthesis Parameter Update test (#169)	X	X	ND

1 D = Destructive, ND = Nondestructive

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, one-way and noisy connections may occur. This test is usually only part of a port's long test sequence and takes about 20 to 30 seconds to complete.

Table 724: TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.

Table 724: TEST #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test and the test has been aborted. Wait until the port is idle (amber LED is off) before retesting. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port was found to be transmitting in error. This will cause noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining the Error Log.

2 of 2

Conference Circuit Test (#7)

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 725: TEST #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test and the test has been aborted. Wait until the port is idle (amber LED is off) before retesting. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to an already existing error on the specific port or a more general circuit pack error. **1** Examine Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. **1** Retry the test. **2** If the test continues to fail, then replace the circuit pack.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining the Error Log.

Speech Synthesis DTMF Receiver Test (#163)

A series of dual-tone multifrequency (DTMF) tones are conferenced from the TDM bus into the port's DTMF receiver and checked to see if the correct tones have been detected during the correct intervals. If every DTMF tone was detected correctly, the test passes. If any of the tones were not detected correctly, the test fails.

Table 726: TEST #163 Speech Synthesis DTMF Receiver

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

Table 726: TEST #163 Speech Synthesis DTMF Receiver

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	DTMF tones were not detected. This type of failure may cause features using touch-tone input to the Speech Synthesis port to malfunction. **1** Verify that the Tone-Clock circuit is functioning correctly by checking the Error Log and using **test tone-clock long**. **2** If the test fails again, replace the Speech Synthesis circuit pack.
	PASS	The port has detected every DTMF tone correctly. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

2 of 2

Speech Synthesis DTMF Receiver Inquiry Test (#164)

This test determines the sanity of the port's dual-tone multifrequency (DTMF) receiver. The on-board microprocessor tests the port's DTMF receiver and determines if it is in a sane (test passes) or insane (test fails) condition.

Table 727: TEST #164 Speech Synthesis DTMF Receiver Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 727: TEST #164 Speech Synthesis DTMF Receiver Inquiry Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The DTMF receiver for this port is insane. **1** If the test fails again, replace the circuit pack.
	PASS	The DTMF receiver for this port is sane. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

2 of 2

Speech Synthesis DSP Tone Test (#165)

The digital signal processor (DSP) associated with each port can generate a 440-Hz tone whose presence can be detected by TN748 General-Purpose Tone Detector circuits. A 440-Hz tone is generated for 500 ms on a specified time slot which is being listened to by the detector circuit. If the detector determines the tone is present on the time slot, the test passes; otherwise, it fails.

Table 728: TEST #165 Speech Synthesis DSP Tone Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle retry the command at 1-minute intervals up to 5 times.
1001 1002 1003	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1021	ABORT	The 440-Hz tone was not detected by the Tone Detector circuit and inter-digit time-out has occurred on the Tone Detector circuit. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, verify that every Tone Detector circuit in the system is functioning correctly by checking the Error Log and using **test board *UUCSS* long**. Replace any faulty circuit packs containing Tone Detector circuits, and repeat the test. **3** If the test continues to abort, replace the Speech Synthesis circuit pack.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 728: TEST #165 Speech Synthesis DSP Tone Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The 440-Hz tone was not detected by the Tone Detector circuits. **1** If the test fails again, verify that every Tone Detector circuit in the system is functioning correctly by checking the Error Log and using **test board *UUCSS* long**. Replace any circuit packs containing faulty Tone Detector circuits, and repeat the test. **2** If the test fails again, replace the Speech Synthesis circuit pack.
	PASS	The 440-Hz tone has been detected correctly. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

2 of 2

Speech Synthesis Memory Test (#166)

The encoded speech for the Speech Synthesis circuit pack is stored in on-board read-only memory (ROM). A checksum is computed for each 32K speech memory block and compared against a known checksum value. If every computed checksum value is successfully compared against the stored checksum values, the test passes. If, while testing the speech complex memory, the on-board microprocessor finds a memory error, the test is terminated and a failure is reported. This type of failure may affect other ports on the Speech Synthesis circuit pack, resulting in errors or alarms on each port.

Table 729: TEST #166 Speech Synthesis Memory Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
1019	ABORT	Test is already running on a different port, possibly due to background maintenance activity. Only one of these tests may be active on a circuit pack at a time. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 729: TEST #166 Speech Synthesis Memory Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The computed checksum from the speech vocabulary ROM did not compare correctly with the stored checksum. This type of failure may cause features using the Speech Synthesis port's speech services to malfunction and result in degradation of synthesized speech quality ranging from insignificant to major. **1** Replace the circuit pack.
	PASS	The computed checksum values were successfully compared against the stored checksum values. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

2 of 2

Speech Synthesis SSD Inquiry Test (#167)

This test determines the sanity of the specified port's speech synthesis device (SSD). The on-board microprocessor tests the port's SSD and determines if it is in a sane (test passes) or insane (test fails) condition. Other ports on the Speech Synthesis circuit pack will continue to function correctly during this type of failure.

Table 730: TEST #167 Speech Synthesis SSD Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The SSD is insane. **1** Replace the circuit pack.
	PASS	The SSD is sane. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis PSS Handshake Test (#168)

This test verifies control functionality between the on-board microprocessor and programmable speech synthesizer (PSS) controller. A failure occurs if either of the following events occur:

- The on-board microprocessor times out while waiting for the PSS controller to respond.
- An invalid command is received by the on-board microprocessor from the PSS controller.

This type of failure will affect all four ports on the Speech Synthesis circuit pack, resulting in errors or alarms on each port.

Table 731: TEST #168 Speech Synthesis PSS Handshake Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The on-board microprocessor has timed out while waiting for the PSS controller to respond or an invalid command has been received by the on-board microprocessor from the PSS controller. This type of failure may cause features using the Speech Synthesis port's speech services to malfunction. **1** Replace the circuit pack.
	PASS	The on-board microprocessor/PSS handshake is working correctly. User-reported troubles should be investigated using other tests and by verifying other ports on this circuit pack are working correctly.

Speech Synthesis Parameter Update Test (#169)

This test updates the dual-tone multifrequency (DTMF) interdigit time-out parameter used by the Speech Synthesis circuit pack so that it is consistent with that specified by the server.

Table 732: TEST #169 Speech Synthesis Parameter Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call and therefore unavailable for certain tests. Wait until the port is idle (amber LED is off) before retesting. **1** If the port is idle, retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	An internal system error has occurred.
	PASS	The DTMF interdigit time-out parameter has been updated. User-reported troubles should be investigated using other tests and by verifying that other ports on this circuit pack are working correctly.

SN-CONF (Switch Node Configuration)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
SN-CONF	MAJOR	**test board *location***	Switch Node Configuration
SN-CONF	MINOR	**test board *location***[2]	Switch Node Configuration

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 **If the error and alarm logs display the switch node carrier location UUC (cabinet and carrier only), run the *long* test sequence on the active SNC in the carrier, (slot 10 or 12). If the error and alarm logs display a circuit pack location, UUCSS, run the *short* test sequence on the alarmed SNI.**

A switch node carrier contains:

- Up to 16 Switch Node Interface (SNI) TN573 circuit packs in slots 2 through 9 and slots 13 through 20
- One or two Switch Node Clock (SNC) TN572 circuit packs in slots 10 and 12
- An Expansion Interface (EI) TN570 circuit pack, a DS1 Converter (DS1C) TN574 circuit pack, or no circuit pack in slot 1
- An optional DS1 converter circuit pack in slot 21

SN-CONF errors and alarms are generated for two types of failures:

1 Failure of a board in the switch node carrier to insert (be detected by software).

2 A problem found by running the Configuration Audit test (#759). Test 759 is executed for either an SNI or SNC circuit pack during scheduled maintenance or as part of **test board *UUCSS***.

For SNI circuit packs, test 759 queries the SNI for SNCs in the same switch node carrier, SNI peers, DS1 converters, and EI or SNI neighbors that the SNI can communicate with and compares this data to the administered data.

For SNC circuit packs, test 759 queries the SNC for SNCs and SNIs in the same switch node carrier that the SNC can communicate with and compares this data to the administered data.

Switch node carriers are part of port-network connectivity (PNC). For background information about PNC, refer to the Maintenance Architecture and Hardware Configurations chapters and related MOs.

Error Log Entries and Test to Clear Values

SN-CONF Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **sh r 1**
5000 (a)	Any	processor route audit (#760)	MINOR	OFF	**test board** *UUCSS* **l rep 1**
6000 (b)	1	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6000 (b)	2	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6001 (c)	Any	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6002 (d)	1	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6002 (d)	2	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6003 (e)	Any	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6004 (f)	Any	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6005 (g)	Any	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6005 (g)	1	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6005 (g)	2	configuration audit (#759)	MAJOR	OFF	**test board** *UUCSS* **rep 1**
6006 (h)	Any	configuration audit (#759)	MINOR	OFF	**test board** *UUCSS* **rep 1**
6007 (i)	Any	configuration audit (#759)	MINOR	OFF	**test board** *UUCSS* **rep 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a At least one administered circuit pack in this switch node carrier was not inserted, or one or more administered circuit packs in this switch node carrier did not respond to Test 760 with a "board insertion" uplink message.

To resolve this error, run test 760 via **test board *UUCSS* l** for an SNC in the same switch node carrier that has this error.

b No neighbor link is administered, but the SNI has one. If the aux data is 1, an EI is connected as a neighbor link. If the aux data is 2, an SNI is connected as a neighbor link.

To resolve error type 6000 with aux data 1, refer to FAIL code 133 for test 759. To resolve error type 6000 with aux data 2, refer to FAIL code 134 for test 759.

c No neighbor link exists between the SNI and its neighbor, but a neighbor link (i.e., fiber link) is administered.

To resolve this error, refer to FAIL code 135 for test 759.

d The physical neighbor type does not match administration. If the aux data is 1, the type of neighbor administered is an SNI and the type of neighbor connected is an EI. If the aux data is 2, the type of neighbor administered is an EI and the type of neighbor connected is an SNI.

To resolve error type 6002 with aux data 1, refer to FAIL code 136 for test 759. To resolve error type 6002 with aux data 2, refer to FAIL code 137 for test 759.

e The neighbor location does not match administration.

To resolve this error, refer to FAIL code 138 for test 759.

f A peer link does not exist to another equipped SNI. The aux data equals the slot number of the SNI to which this SNI or SNC does not have a peer link. To resolve this error, refer to the FAIL code for test 759 corresponding to the aux data on the following table:

Aux Data (slot no.)	Test 759 FAIL Code
2	102
3	103
4	104
5	105
6	106
7	107
8	108
9	109
13	113
14	114
15	115
16	116
17	117
18	118
19	119
20	120

g A link does not exist to one of the SNCs. If the aux data is not 1 or 2, the link from this SNI to the active SNC does not exist. If the aux data is 1, the link from this SNC to the active SNC does not exist. If the aux data is 2, the link from this SNC to the standby SNC does not exist.

To resolve this error, refer to FAIL code 112 for test 759.

h The SNI is administered to be connected to a DS1C but is not.

To resolve this error, refer to FAIL code 139 for test 759.

i The SNI is connected to a DS1C, but no DS1C is administered.

To resolve this error, refer to FAIL code 140 for test 759.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Processor Route audit (#760)		X		ND

1 D = Destructive, ND = Nondestructive

Configuration Audit (#759)

This test is nondestructive.

NOTE:
For descriptions of result codes for this test see:

- ‘‘SNC-BD (Switch Node Clock Circuit Pack)’’ when the circuit pack tested is a Switch Node Clock (circuit pack slots 10 or 12).
- ‘‘SNI-BD (SNI Circuit Pack)’’ when the circuit pack tested is a Switch Node Interface (circuit pack slots 2–9 or 13–20).

This test is run via **test board short** or **test board long** for SNI circuit packs or SNC circuit packs.

For SNI circuit packs, this test queries the SNI for SNCs in the same switch node carrier, SNI peers, DS1Cs, and EI or SNI neighbors that the SNI can communicate with and compares this data to the administered data.

For SNC circuit packs, this test queries the SNC for SNCs and SNIs in the same switch node carrier that the SNC can communicate with and compares this data to the administered data.

Failures of this test cause entries in the error and alarm logs against Switch Node Configuration (SN-CONF) with the board location of the SNI or SNC.

Incorrectly Connected Administered Fibers

Some physically connected fibers that do not match fiber administration can cause port network problems that are not detected and alarmed by PNC test. The symptoms will usually be phone calls not working correctly, and port network component alarms because of translation mismatches.

This test is unable to detect the case where an SNI is connected to the same type of board (EI or SNI) as administered but located in a different cabinet but the same carrier and same slot as the administered fiber endpoint. Use **list fiber-link** to view the administered fiber endpoint. This test detects if the fiber endpoint connected to the SNI is in a different carrier, slot location than the administered fiber endpoint.

Incorrectly Connected Administered SNI-to-EI Fibers

If the SNI is connected to the same type of fiber endpoint as the administered fiber endpoint, but the location is the same as administered except for the cabinet, every phone call will work incorrectly; some phone calls will not go through and others will ring the wrong phone.

Use **test led** to check connectivity.

1. Run **test led port-network** on each administered port network and verify that the LEDs on the correct port network are lit.
2. If they are not lit, check that the fiber connections to the port network are consistent with the administered fibers (**list fiber-link**) that does not light the LEDs as expected.
3. Run **test led switch-node** on each administered switch node carrier and verify that the LEDs on the correct carrier are lit.
4. If they are not, check the connectivity to the switch node carrier that does not light the LEDs as expected.

Incorrectly Connected SNI-to-SNI Fibers between Three Switch Nodes

If the system has more than 2 switch nodes, SNI-to-SNI fibers administered between 2 switch nodes could be incorrectly connected to a third switch node. This is a problem that could occur during installation or when inter-switch node fibers are changed. For multiple fibers to a distant switch node, an incorrect connection would not appear as a problem unless this fiber is used for a system-link to a port network connected to the distant switch node. Use **status sys-link** to determine the boards in the path from an IPSI-connected PN to another specific PN. A specific SNI-to-SNI fiber connection must be in the system-link path to be checked with the port network LED test.

Forcing SNI-to-SNI Fiber Connection

To force an SNI-to-SNI fiber connection to be used as a system-link, remove every SNI-to-SNI connection except the fiber link being tested at the distant switch node by removing SNI boards in the distant switch node.

1. Use **status sys-link** to verify that the fiber selected for test is in the path to the PN connected to the distant switch node that will be used for the LED test.
2. Run **test led** to a port network as described above to verify this fiber connection.
3. Repeat the above procedure for each of the SNI-to-SNI fibers terminating on the distant switch node.

Testing Multiple Fiber Connections

To test multiple fiber connections to a distant switch node:

1. Use **list fiber-link** to determine the number of SNI-to-SNI fibers that are administered to and terminate on the distant switch node.
2. Run **test led port-network** on a PN connected to the distant switch node, and verify the LEDs on the correct PN are lit.
3. Use **status sys-link** and select the active EI in the IPSI-connected PN connected to the distant PN under test. (The display will show the path from the IPSI-connected PN and the SNI-to-SNI fiber being used.)
4. If the PN's LEDs are lit and there are multiple fibers to the distant switch node, remove the SNC that is listed by **list fiber-link** for this path.

   If not, enter **list fiber-link** to verify that the fiber connections to the PN are consistent with the administration assignments.
5. Use **status sys-link** to determine the new path from the IPSI-connected PN to the distant switch.
6. Run **test led port-network** on the port network connected to the distant switch node, and verify that the LEDs on the correct PN are lit.
7. Repeat steps 4 – 6 until every SNI-to-SNI fiber connection to the distant switch has been tested.

Processor Route Audit Test (#760)

This test is nondestructive.

This test sends a processor route to every SNI in the carrier for which **test board *UCSS*** was run. A processor route enables an SNI board to send up-link messages to the server by providing the board with a specific sequence of boards for routing messages up to the server. Without a processor route, an SNI cannot send any in-line errors to the server.

As each SNI receives its processor route, the SNI returns a "board insertion" up-link message, and (if not already inserted) the server's software inserts that board. Depending on the configuration, each SNI board is sent either one or two processor routes.

Use **test led** or **list config carrier** to see if the boards are inserted.

The processor route test is run as part of the long test sequence for SNC boards.

Table 733: TEST #760 Processor Route Audit Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.

1 of 2

Table 733: TEST #760 Processor Route Audit Test

Error Code	Test Result	Description / Recommendation
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	None of the circuit packs in this switch node carrier are responding to the processor route messages sent by software. **1** Run **test led switch-node** for the switch node where this switch node carrier resides to verify whether the LEDs on any of the boards light. **2** If none of the LEDs light for the boards in this carrier, fix any problems associated with the connectivity of this carrier to the server. **a** Use **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with an IPSI-connected PN. **d** Also, follow the repair procedures for any SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	FAIL	If this test fails, one or more administered circuit packs in this switch node carrier did not respond with a “board insertion” uplink message. Use **list config carrier *UUC*** to verify that administered SNI and SNC boards match the physically installed SNI and SNC boards. The command output shows “NO BOARD” for every board that is administered, but not inserted. • If every administered board is inserted, run this test again. • If administration does not match the physical configuration, and is *correct*, insert the missing circuit packs in this switch node carrier. • If administration does not match the physical configuration, and is *incorrect*, change the administration, and run this test again. • If *none* of the administered boards in this switch node carrier were inserted, fix any other SN-CONF errors by following the repair procedures for SN- CONF. Use **display errors** with category **pnc** to view SN-CONF errors. Use **list sys-link** to see if any INLs, LNLs, or RNLs are down. If any INLs, LNLs, or RNLs are down, see “SYS-LINK (System Links)” for fixing link problems.
	PASS	If this test passes, every administered circuit pack in this switch node carrier was inserted.

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SNC-BD (Switch Node Clock Circuit Pack)

S8700 MC

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
SNC-BD	MAJOR	**test board *location* s**	SNC Circuit Pack
SNC-BD	MINOR	**test board *location* s**	SNC Circuit Pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

The Switch Node Clock (SNC) TN572 circuit pack is part of the Center Stage Switch (CSS) configuration. It resides in a switch node carrier that alone or with other switch nodes make up a CSS. In a high-reliability system (duplicated server and control network, unduplicated PNC), each SNC is duplicated such that there are two SNCs in each switch node carrier. In a critical-reliability system (duplicated server, control network, and PNC), each switch node is fully duplicated, and there is one SNC in each switch node carrier. SNCs are placed in slots 10 and 12 of the switch node carrier.

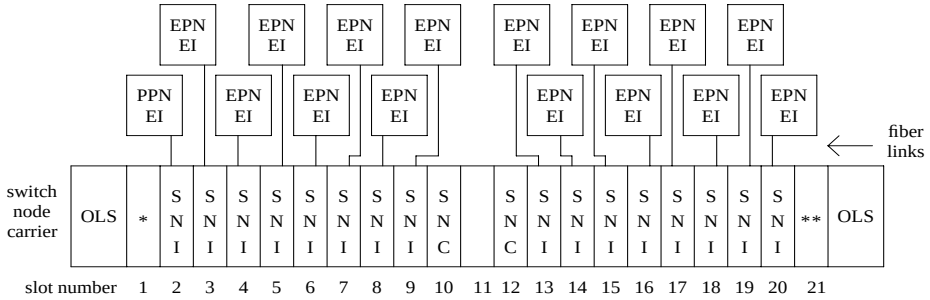
The active SNC communicates with each circuit pack in the switch node carrier over the serial channel bus on the backplane. In addition, the active SNC provides timing to the circuit packs in the switch node carrier via the clock buses. The active SNC uses Timing Priority Number (TPN) links with each Switch Node Interface (SNI) and the other SNC to receive and distribute TPNs. TPNs are used for setting up the correct timing distribution for the switch node carrier. The active SNC receives timing for the switch node carrier from each SNI circuit pack in the carrier and chooses the SNI with the best timing reference for the switch node carrier timing signal the SNC puts out on the clock buses. The timing reference for each SNI is derived from the fiber signal to each SNI. The active SNC chooses the SNI to receive timing from by choosing the SNI with the lowest numbered TPN which means that the SNI is closest to the system timing source. The active SNC also verifies that the SNI reference signal is good before using that SNI as the timing reference for the switch node carrier. The active SNC then supplies this timing over the clock buses on the backplane to every SNI and SNC circuit pack in the carrier. For more information about timing synchronization (including how the SNC fits into the overall synchronization configuration), see SW-CTL (Switch Control) on page 1742.

The SNC circuit packs are associated with three MOs:

- The "SNC-BD (Switch Node Clock Circuit Pack)" MO covers general SNC board errors and errors with the serial communication channel between the active and standby SNCs.
- The "SNC-LINK (Switch Node Clock Link)" MO covers errors between the active SNC and SNIs over the serial channel (aux data is 1). Also, the SNC-LINK MO covers TPN Link errors between the active SNC and SNIs (aux data is 2).
- The "SNC-REF (Switch Node Clock Reference)" MO covers errors the active SNC detects with SNI reference signals.

SNC circuit packs are part of port-network connectivity (PNC). For background information about PNC, refer to the Maintenance Architecture and Hardware Configurations chapters.

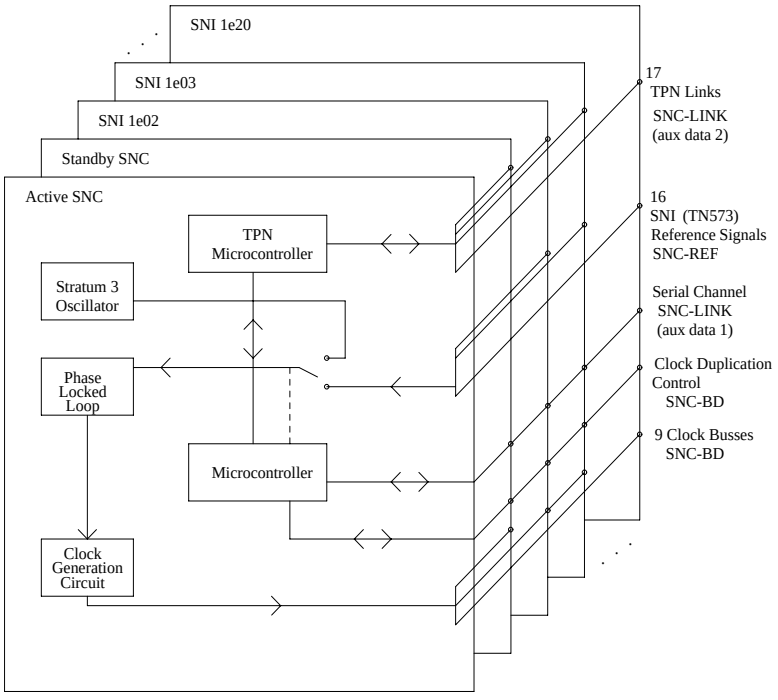
Figure 120: A Center Stage Switch Configuration



* = An EI or a DS1C circuit pack may reside in this slot
** = A DS1C circuit pack may reside in this slot

Switch Node Clock (SNC) TN572
Switch Node Interface (SNI) TN573
Expansion Interface (EI) TN570
DS1 Converter (DS1C) TN574
Online Switcher (OLS) power supply

Figure 121: SNC Functions



SNC LEDs

SNC circuit packs have the standard red, green, and yellow LEDs. The red and green LEDs operate as usual: red means an alarm condition and green indicates maintenance testing in progress. If the yellow LED is lit, this indicates that the SNC is the active circuit pack, supplying timing to the carrier. In a duplex- or high-reliability system (unduplicated PNC), the standby SNC in a carrier is unlit. In a critical-reliability system (duplicated PNC), an SNC in a standby switch node carrier is lit since it is providing timing for the standby carrier.

Clear Firmware-Counters Command

SNC firmware generates error reports independently of technician-demanded tests. Therefore, **test board *UUCSS*** clear does not affect the error status reported by firmware. The **clear firmware-counters** command clears every firmware-generated error unconditionally.

Use **clear firmware-counters *UUCSS*** to send a downlink message to the SNC circuit pack, causing it to clear out its firmware error counters and failure database. When the firmware failure database is cleared, the failure audit test (#777) will pass. If problems still exist, the firmware increments its error counters and the failure audit test begins failing again.

Do not use this command instead of the repair procedures associated with the hardware error log entries. This command may be useful if a problem was fixed but the off-board alarms associated with the problem are still active.

Replacing SNC Circuit Packs

WARNING:

Do not power down a Switch Node carrier to replace a circuit pack. Replacing an SNC on a system with unduplicated SNCs disrupts service.

Standard-Reliability System (Unduplicated server, PNC, and SNCs)

This procedure is destructive. Any links through the switch node carrier will go down.

1. Pull out the SNC circuit pack to be replaced.
2. Insert a new SNC circuit pack.
3. Wait for the SNC to reset. (The red and green LEDs light and then go out. The yellow LED should be on solid.)
4. **Test alarm long clear** category **exp-intf**. *Do not busyout the Expansion Interface circuit packs.*
5. Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1 CONV-BD alarms to clear, or enter **clear firmware-counters**.

High-Reliability System (Duplicated Server and SNCs, Unduplicated PNC)

This procedure is **non**destructive.

1. If the SNC circuit pack to be replaced is the active SNC in the switch node carrier (yellow LED is on solid), use **set switch-node-clock** to set the standby SNC to active.
2. When the SNC circuit pack is in standby mode (yellow LED is off), pull out the SNC circuit pack to be replaced.
3. Insert a new SNC circuit pack.
4. Wait for the SNC to reset. (The red and green LEDs light and then go out.) The yellow LED should be off because the SNC circuit pack is in standby mode.

Critical-Reliability System (Duplicated Server and PNC)

WARNING:

On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WARNING alarm against TDM-CLK with error type 2305. Repairs to standby PNC in this state may disrupt service. Otherwise, if the active PNC is functional, replacement of a standby component will not disrupt service.

STEPS:

Enter **status pnc**	Verify that the component to be replaced is on the standby PNC.
Enter **busyout pnc**	
Enter **busyout board *UUCSS***	UUCSS represents the cabinet-carrier-slot address of the circuit pack to be replaced.
Replace the circuit pack	
Enter **release board *UUCSS***	**CAUTION:** Do not busyout any Expansion Interface circuit pack after this point.
Enter **test alarms long clear** for category **exp-intf**	
Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C alarms to clear, or enter **clear firmware-counters a-pnc | b-pnc**	Use the letter designation of the pnc which holds the replaced component (the standby pnc).
Enter **status pnc**	If either PNC's state of health is not "functional", consult PNC-DUP (PNC Duplication) on page 1477.
Enter **release pnc**	

Error Log Entries and Test to Clear Values

Table 734: SNC Board Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **r 1**
1 (a)	Any	Failure audit (#777)	MAJOR	ON	**test board** *UUCSS* **r 1**
18 (b)	0	**busyout board** *UCSS*	WARNING	OFF	**release board** *UCSS*
257 (c)	Any	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
513 (d)	Any	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
769 (e)	Any	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1025 (f)	Any	Failure audit (#777)	MAJOR	ON	**test board** *UUCSS* **r 1**
1281 (g)	Any	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1537 (h)	Any	Failure audit (#777)	MINOR	ON	**test board** *UUCSS* **r 1**
1793 (i)	Any	Failure audit (#777)	MAJOR	ON	**test board** *UUCSS* **r 1**
2049 (j)	Any	Failure audit (#777)	MAJOR	ON	**test board** *UUCSS* **r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a Error type 1 indicates SNC on-board microcontroller error. (This occurs when the microcontroller sanity test fails, the ROM has problems, the processor internal or external RAM is faulty, or the firmware instruction test fails. In addition, this error indicates problems with the interrupt capabilities, the dual-port RAM and the RTM (real-time monitor) interface on the faceplate of the SNC.)

Replace the SNC circuit pack.

b This error indicates that the SNC circuit pack was busied out via **busyout board *UCSS***. To resolve this error, use **release board *UCSS*** to release the SNC circuit pack.

c These errors occur when firmware detects failure of the phase-locked loop, inability to lock, or failure of the clock drivers and the problem is off-board.

1 Enter **display errors** and if SNC-BD error type 1793 exists in the hardware error log, follow the repair procedures for SNC-BD error 1793.

2 Enter **display errors** and if no SNI-BD 1025 errors exist in the error log, replace the active SNC.

3 Enter **display errors** and if any SNI-BD 1025 errors exist in the error log, follow the repair procedure in the SNI-BD section for these errors.

d This error occurs when the active SNC determines that there is a problem communicating with the standby SNC via the connecting serial channel.

If the switch node carrier is administered with duplicate SNCs:

1 If the standby SNC (the one with its yellow LED off) has this error, escalate the problem. (**Status switch-node** also shows the active and standby SNCs.

2 If the system originally had duplicate SNCs and the standby SNC was removed and never replaced and the active SNC has not been reset after the standby SNC was removed, this error will occur.

If you do not intend to replace the SNC:

a Remove the standby SNC from circuit pack administration via **change circuit-pack**.

b If the problem persists, replace the active SNC circuit pack.

Otherwise:

a Insert an SNC circuit pack.

3 Use **display errors** to check the error log. If SNIs in the switch node carrier also have problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), then replace the active SNC.

4 Replace the standby SNC circuit pack.

5 Retry **test board**. Use **display errors** to check the error log. If this error is still in the error log, replace the active SNC.

If the switch node carrier is administered with only one SNC:

1 If step 2 above does not apply, replace the SNC.

e This error occurs when the standby SNC determines that there is a problem communicating with the active SNC via the connecting serial channel.

1 If the active SNC (the one with its yellow LED on) has this error, escalate the problem. (**Status switch-node** also shows the active and standby SNCs.

2 Use **display errors** to check the error log. If more than one SNI in the switch node carrier has problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), then replace the active SNC.

3 If a single SNI has SNI-BD error 257, replace the SNI circuit pack.

4 Replace the standby SNC circuit pack.

5 Retry **test board**. Use **display errors** to check the error log. If this error is still in the error log, replace the active SNC.

f This error occurs when the firmware detects problems with the various hardware circuit monitors (e.g., loss of reference monitor) that verify correct operation of the reference links.

Replace the SNC circuit pack.

g This error occurs when the firmware detects problems with the interface used to track the status of both SNCs when there are duplicated SNCs in a switch node carrier. When this error occurs, software may have incorrect information from SNC firmware for which SNC is active. Therefore, the yellow LEDs on the SNCs must be checked in the following repair procedure and the **status switch-node** command should not be used when this error type occurs.

If the switch node carrier has duplicate SNCs:

1 Replace the SNC that does not have its yellow LED lit.

2 Retry **test board**. Use **display errors** to check the error log. If the error is still in the error log, replace the SNC that has its yellow LED lit.

If the switch node carrier has only one SNC, replace the SNC.

h This error occurs when a loss of signal from the SNC on-board Stratum-3 oscillator is detected by the firmware.

Replace the SNC circuit pack.

i These errors occur when firmware detects failure of the phase-locked loop, inability to lock, or failure of the clock drivers and the problem is on-board.

Replace the SNC circuit pack.

If the error persists, follow normal escalation procedures.

j This error occurs when the firmware detects problems with the microcontroller used for Timing Priority Number processing.

Replace the SNC circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Configuration* audit (#759), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Processor Route audit (#760)		X		ND
SNC On-Board test (#778)	X	X		ND
TPN test (#779)	X	X		ND
Switch Node Clock Reset test (#780)			X	D

1 D = Destructive, ND = Nondestructive

NOTE:
Test #983 is not an actual demand maintenance test. This test number is used to report the results of **clear firmware-counters**. Refer to error codes for Test #777.

Configuration Audit (#759)

This test is nondestructive.

This test is run via **test board short** or **test board long** for SNC circuit packs.

For SNC circuit packs, this test queries the SNC for SNCs and SNIs in the same switch node carrier that the SNC can communicate with and compares this data to the administered data.

Failures of this test cause entries in the error and alarm logs against Switch Node Configuration (SN-CONF) with the board location of the SNC.

Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where this board resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See SNC-BD (Switch Node Clock Circuit Pack) on page 1625 for the procedure for replacing an SNC. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. a. Check **list fiber-link** to see the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **display errors,** and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. d. Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
102	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 2. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to see if an SNI is physically present in slot 2. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 2: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board *UUCSS*** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 2, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 2, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 1, replace the SNI in slot 2. Replacing an SNI may interrupt service. See SNI-BD (SNI Circuit Pack) on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 1, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
103	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 3. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 3. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 3: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board *UUCSS*** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 3, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 3, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 257, replace the SNI in slot 3. Replacing an SNI may interrupt service. See SNI-BD (SNI Circuit Pack) on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 257, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
104	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 4. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 4. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 4: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 4, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 4, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 513, replace the SNI in slot 4. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 513, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
105	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 5. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 5. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 5: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 5, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 5, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 769, replace the SNI in slot 5. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 769, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
106	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 6. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 6. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 6: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 6, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 6, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 1025, replace the SNI in slot 6. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 1025, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
107	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 7. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 7. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 7: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 7, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 7, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 1281, replace the SNI in slot 7. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 1281, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
108	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 8. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 8. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` • If an SNI is not supposed to be installed in slot 8: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 8, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 8, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 1537, replace the SNI in slot 8. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 1537, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
109	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 9. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 9. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board`: • If an SNI is not supposed to be installed in slot 9: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. • If an SNI is supposed to be installed in slot 9, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 9, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 1793, replace the SNI in slot 9. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 1793, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
112	FAIL	The SNC circuit pack cannot communicate with the other SNC. If this test was run on the active SNC and if the switch node carrier is administered with duplicate SNCs: **1** If the system originally had duplicate SNCs and the standby SNC was removed and never replaced, this error will occur. *If you do not intend to replace the SNC:* **a** Use **change circuit-pack** to remove the standby SNC from administration. **b** If the problem persists, reset the active SNC circuit pack via **reset board *UUCSS***. If the problem persists after the reset, replace the active SNC circuit pack. **2** Use **display errors** to check the error log. If SNIs in the switch node carrier also have problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), replace the active SNC. **3** Replace the standby SNC circuit pack. **4** Retry **test board**. If this test continues to fail, replace the active SNC. If this test was run on the active SNC and if the switch node carrier is administered with only one SNC: **1** Replace the SNC.
112	FAIL *(cont'd)*	If this test was run on the standby SNC**:** **1** Use **display errors** to check the error log. If more than one SNI in the switch node carrier has problems communicating with the active SNC (i.e., error code 257 is logged against SNI-BD), then replace the active SNC. **2** Replace the standby SNC circuit pack. **3** Retry **test board**. Use **display errors** to check the error log. If this error is still in the error log, replace the active SNC.

Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
113	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 13. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 13. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board`: If an SNI is not supposed to be installed in slot 13: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 13, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 13, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 2049, replace the SNI in slot 13. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 2049, replace the SNC circuit pack. *11 of 18*

Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
114	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 14. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 14. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` do one of the following: If an SNI is not supposed to be installed in slot 14: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 14, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 14, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 2305, replace the SNI in slot 14. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 2305, replace the SNC circuit pack.

Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
115	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 15. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 15. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` If an SNI is not supposed to be installed in slot 15: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 15, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 15, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 2561, replace the SNI in slot 15. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 2561, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
116	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 16. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 16. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` If an SNI is not supposed to be installed in slot 16: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 16, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 16, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 2817, replace the SNI in slot 16. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 2817, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
117	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 17. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 17. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` If an SNI is not supposed to be installed in slot 17: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 17, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 17, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 3073, replace the SNI in slot 17. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 3073, replace the SNC circuit pack. *15 of 18*

Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
118	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 18. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 18. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` If an SNI is not supposed to be installed in slot 18: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 18, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 18, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 3329, replace the SNI in slot 18. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 3329, replace the SNC circuit pack.

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Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
119	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 19. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 19. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` If an SNI is not supposed to be installed in slot 19: **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 19, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 19, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 3585, replace the SNI in slot 19. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 3585, replace the SNC circuit pack. *17 of 18*

Table 735: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
120	FAIL	The SNC circuit pack cannot communicate with the SNI in slot 20. **1** If a standby SNC (one with its yellow LED off) was tested and resulted in this error code, follow normal escalation procedures. **Status switch-node** also shows the active and standby SNCs. **2** Use **list configuration carrier** to determine whether an SNI is physically present in slot 20. If the `Vintage` field indicates that a circuit pack is present, proceed to step 3. If the `Vintage` field shows `no board:` If an SNI is not supposed to be installed in slot 20 **a** This failure will not affect service. Use **change circuit-pack** to remove the missing SNI from administration. **b** If the error persists, use **reset board UUCSS** to reset the active SNC circuit pack. If the error still appears, replace the active SNC circuit pack. If an SNI is supposed to be installed in slot 20, insert one. **3** **Display errors** for category **pnc**. If the SNC has SNC-BD error 513, or SNC-LINK errors with aux data 1 pointing to other SNIs besides the one in slot 20, replace the active SNC circuit pack. **4** If SNIs in the same carrier have SNI-BD error 257 logged, (indicating they are having trouble communicating with the SNC), replace the active SNC circuit pack. **5** If the SNC being tested has SNC-LINK error type 3841, replace the SNI in slot 20. Replacing an SNI may interrupt service. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **6** If the SNC being tested still has SNC-LINK error type 3841, replace the SNC circuit pack.
	PASS	The administered data and the circuit packs the SNC can communicate with match.
0	NO BOARD	No board was detected by the test. **1** Check that SNC board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

Processor Route Audit Test (#760)

This test is nondestructive.

This test sends a processor route to every SNI in the carrier for which the **test board *UCSS*** command was run. A processor route enables an SNI board to send uplink messages to the server by providing the board with a specific sequence of boards for routing messages up to the server. Without a processor route, an SNI cannot send any in-line errors to the server.

As each SNI receives its processor route, the SNI returns a "board insertion" uplink message, and (if not already inserted) the server's software inserts that board. Depending on the configuration, each SNI board is sent either one or two processor routes.

Use **test led** or **list config carrier** to see if the boards are inserted.

Table 736: TEST #760 Processor Route Audit Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	None of the circuit packs in this switch node carrier are responding to the processor route messages sent by software. **1** Run **test led switch-node** for the switch node where this switch node carrier resides to verify whether the LEDs on any of the boards light. **2** If none of the LEDs light for the boards in this carrier, fix any problems associated with the connectivity of this carrier to the server. a. Use **list fiber link** to obtain a list of the fiber connections to this carrier. b. Check the LEDs on every SNI and EI, and fix any fiber problems. c. Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. d. Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 736: TEST #760 Processor Route Audit Test

Error Code	Test Result	Description / Recommendation
	FAIL	If this test fails, one or more administered circuit packs in this switch node carrier did not respond with a "board insertion" uplink message. Use **list config carrier *UUC*** to verify that the administered SNI and SNC boards match the physically installed SNI and SNC boards. The output shows "NO BOARD" for every board that is administered, but not inserted. • If every administered board is inserted, run this test again. • If administration does not match the physical configuration, and is correct, insert the missing circuit packs in this switch node carrier. • If *none* of the administered boards in this switch node carrier were inserted, fix any other SN-CONF errors by following the repair procedures for SN-CONF. Use **display errors pnc** to view SN-CONF errors. Next check if any INLs, LNLs, or RNLs are down, see "SYS-LINK (System Links)" for fixing link problems.
	PASS	If this test passes, every administered circuit pack in this switch node carrier was inserted.
0	NO BOARD	No board was detected by the test. **1** Check that SNC board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Failure Audit (#777)

This test is nondestructive.

This test queries an SNC for any existing failures and any unacknowledged "cleared failure" messages. Each failure generates an error and alarm entry against SNC-BD, SNC-LINK, or SNC-REF. A "cleared failure" message is a message an SNI circuit pack sends to software indicating the resolution of a previous failure. This message is "unacknowledged" if the SNI circuit pack never receives a response from software indicating it's own receipt of the original "cleared failure" message.

If no failures are detected by the SNC circuit pack, this test will pass.

If this test reports failures, the **test board** screen shows **FAIL** with no FAIL code. Use **display errors pnc** to show the error log and view SNC-related errors: SNC-BD, SNC-LINK, and SNC-REF.

Table 737: TEST #777 Failure Audit

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where this board resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See ''SNC-BD (Switch Node Clock Circuit Pack)'' on page 1625 for the procedure for replacing an SNC. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Use **list fiber-link** to obtain a list of the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
	FAIL	The SNC circuit pack reported failures or retransmitted a “cleared failure” message. **1** Check the error and alarm logs for SNC-BD, SNC-LINK, or SNC-REF entries. Use **display errors** and **display alarms** with category PNC. Fix any problems found by following repair procedures for the SNC Board, SNC Link, or SNC Reference Error Log Entries tables in this section. **2** If no SNC-BD, SNC-LINK, or SNC-REF errors exist in the error and alarm logs, retry the command.

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Table 737: TEST #777 Failure Audit

Error Code	Test Result	Description / Recommendation
	PASS	No problems are detected on the board.
0	NO BOARD	No board was detected by the test. **1** Check that SNC board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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SNC On-Board Test (#778)

This test is nondestructive.

This test queries the SNC circuit pack for status of the background tests run on-board. These background tests include an SNC on-board microcontroller test, clock test, an SNC on-board Stratum-3 oscillator test, and TPN microcontroller test.

Table 738: TEST #778 SNC On-Board Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNC circuit pack responded that the software test requested is not valid. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNC firmware is not able to run the test. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 738: TEST #778 SNC On-Board Test

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where this board resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for the procedure for replacing an SNC. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Use **list fiber-link** to obtain a list of the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
101	FAIL	The SNC circuit pack has on-board microcontroller failure.
128	FAIL	The SNC circuit pack has a problem with its clock; firmware has detected a phase-locked loop failure, an inability to lock, or a failure of the clock drivers.
129	FAIL	The SNC circuit pack has a problem with the SNC on-board Stratum-3 oscillator.
130	FAIL	The SNC circuit pack has a problem with the TPN microcontroller. **1** Replace the SNC circuit pack.
	PASS	No problems exist with the on-board functions verified by this test.

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Table 738: TEST #778 SNC On-Board Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. **1** Check that SNC board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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TPN Test (#779)

This test is nondestructive.

This test queries the SNC circuit pack for status of the ROM and internal RAM background tests for the TPN microcontroller.

Table 739: TEST #779 TPN Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received unexpected message data from the SNC circuit pack. **1** Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNC circuit pack responded that the software test requested is not valid. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNC circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 739: TEST #779 TPN Test

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node where this board resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for the procedure for replacing an SNC. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Use **list fiber-link** to list the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
	FAIL	The test failed. Replace the SNC circuit pack.
	PASS	No problems exist with the TPN microcontroller.
0	NO BOARD	No board was detected by the test. **1** Check that SNC board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Switch Node Clock Reset Test (#780)

This test is **destructive**.

This test resets the SNC circuit pack via **reset board *UUCSS*** when an SNC circuit pack location is entered. If the system has PNC duplication, the active SNC on the active PNC cannot be reset.

If the SNC is active and **reset board** is executed, an SNI in the same carrier as the SNC will be told by software to reset the SNC via the TPN link. If no inserted SNIs in the same carrier as the SNC can successfully reset the SNC, software will send a “reset” message directly to the SNC. Software first tries to reset the SNC via an SNI in case the SNC is insane because the latter method (sending the “reset” message directly to the SNC) will not work if the SNC is insane.

If an active SNC is reset and a standby SNC exists in the same switch node carrier, the standby SNC becomes active. Use **set switch-node-clock *UUCSS*** to make a standby SNC active, not **reset board**.

If the SNC is standby and **reset board** is executed, the active SNC is told by software to reset the standby SNC via the TPN link.

An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software.

Table 740: TEST #780 Switch Node Clock Reset Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received unexpected message data from the SNC circuit pack. **1** Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNC circuit pack responded that the software test requested is not valid. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNC circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 740: TEST #780 Switch Node Clock Reset Test

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNC circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node where the SNC resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNC may be service interrupting. See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for the procedure for replacing an SNC. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **e** Use **list fiber-link** to list the fiber connections to this carrier. **f** Check the LEDs on every SNI and EI, and fix any fiber problems. **g** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **h** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	The "reset" message was sent out successfully to the active SNC or to an SNI. A PASS does not necessarily mean the SNC circuit pack was successfully reset. The reset can be verified by checking that the red and green LEDs turn on and then turn off. If an SNC circuit pack fails one of the firmware tests run during its reset sequence, the red LED will stay on and the circuit pack should be replaced.
0	NO BOARD	No board was detected by the test. **1** Check that SNC board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNC should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNC. It may be necessary to use **reset board** if the SNC circuit pack gets into a mode where it cannot communicate with software. If an SNC with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Clear Firmware-Counters (#983)

This test number is used to report unsuccessful results of **clear firmware-counters**. This is not an actual demand maintenance test. If the command aborts, refer to the error codes listed for Test #777.

SNC-LINK (Switch Node Clock Link)

S8700 MC

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
SNC-LINK	MINOR	**test board *location* s**	SNC Link

1 For information on specifying a ***location***, see Command Syntax on page 179.

The SNC-LINK MO reports errors in communications between the active Switch Node Clock and Switch Node Interfaces over the serial channel (aux data 1) and the TPN link (aux data 2). SNC-LINK errors are described on the following pages. For a complete description of SNCs and SNIs, including circuit pack replacement instructions, see MOs "SNI-BD (SNI Circuit Pack)" and "SNC-BD (Switch Node Clock Circuit Pack)".

Error Log Entries and Test to Clear Values

Table 741: SNC-LINK Hardware Error Log Entries

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[2]	0		Any	Any	Any	**test board** *UUCSS* **r 1**
1	1 (a)	2	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1	2 (b)	2	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
257	1 (a)	3	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
257	2 (b)	3	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
513	1 (a)	4	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
513	2 (b)	4	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
769	1 (a)	5	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
769	2 (b)	5	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1025	1 (a)	6	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1025	2 (b)	6	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1281	1 (a)	7	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1281	2 (b)	7	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1537	1 (a)	8	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1537	2 (b)	8	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1793	1 (a)	9	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
1793	2 (b)	9	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2049	1 (a)	13	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2049	2 (b)	13	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2305	1 (a)	14	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**

Table 741: SNC-LINK Hardware Error Log Entries

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2305	2 (b)	14	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2561	1 (a)	15	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2561	2 (b)	15	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2817	1 (a)	16	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
2817	2 (b)	16	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3073	1 (a)	17	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3073	2 (b)	17	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3329	1 (a)	18	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3329	2 (b)	18	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3585	1 (a)	19	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3585	2 (b)	19	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3841	1 (a)	20	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**
3841	2 (b)	20	Failure audit (#777)	MINOR	OFF	**test board** *UUCSS* **r 1**

2 of 2

1 The location of the SNI with which the SNC cannot communicate.

2 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a This error occurs when the active SNC determines that there is a problem communicating with an SNI circuit pack in the same carrier via the connecting multiprocessor serial channel used for transmitting CSCN messages. The slot location of the SNI with which the SNC cannot communicate is given in Table 741.

1 Use **display errors** to check the error log.

2 If a SNI-PEER error exists in the hardware error log, follow the repair procedures for SNI-PEER errors.

3 If the SNC has SNC-LINK errors with aux data of 1 against other SNIs and/or has SNC-BD error 513, replace the SNC circuit pack.

4 If SNIs in the same carrier have SNI-BD error 257 logged indicating they are having trouble communicating with the SNC, replace the SNC circuit pack.

5 Use **list configuration carrier** to determine whether an SNI is physically present in the slot pointed to by the SNC-LINK error.

- If the `Vintage` field indicates that a circuit pack is present, proceed to step 6.
- If the `Vintage` field shows `no board:`

  If an SNI is not supposed to be installed in this slot:

— Remove the SNI from circuit pack administration with **change circuit-pack**.

— If the error remains, readminister the SNI circuit pack and then remove it from administration again.

— If the error still remains, replace the active SNC circuit pack.

If an SNI should be installed in this slot, but is missing, insert an SNI circuit pack.

6 Replace the SNI that the SNC is complaining about.

7 Retry the command. If this error is still in the error log:

8 Replace the SNC circuit pack.

9 If a standby SNC (the one with its yellow LED off) has this error, escalate the problem. **Status switch-node** also shows the active and standby SNCs.

b This error occurs when the active SNC determines that there is a problem communicating with an SNI circuit pack in the same carrier via the TPN communication channel. The slot location of the SNI with which the SNC cannot communicate is given in Table 741, SNC-LINK Hardware Error Log Entries, on page 1660.

1 Use **display errors** to check the error log. If more than one SNI in the same carrier have SNI-BD errors with error type 769, replace the SNC.

2 Use **display errors** to check the error log. If the SNC has more than one SNC-LINK error with aux data of 2, replace the SNC.

3 Verify that the SNI the SNC is complaining about exists in the slot indicated by the error code. If the SNI does not exist:

If you do not intend to replace the SNI:

a Use **change circuit-pack** to remove the SNI from circuit pack administration.

b If the error remains, readminister the SNI circuit pack and then remove it from administration again.

c If the problem persists, replace the active SNC circuit pack.

Otherwise:

a Insert an SNI circuit pack.

4 Replace the SNI circuit pack that the SNC is complaining about.

5 Retry the command. If this error is still in the error log:

6 Replace the SNC circuit pack.

7 If a standby SNC (the one with its yellow LED off) has this error, escalate the problem. **Status switch-node** also shows the active and standby SNCs.

8 Retry the command. If this error is still in the error log, escalate the problem.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Configuration* audit (#759), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Processor Route audit (#760)		X		ND
SNC On-Board test (#778)	X	X		ND
TPN test (#779)	X	X		ND
Switch Node Clock Reset test (#780)			X	D

1 D = Destructive, ND = Nondestructive

See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for descriptions of tests and results.

SNC-REF (Switch Node Clock Reference)

S8700 MC

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
SNC-REF	MAJOR	**test board *location* s**	SNC Reference

1 For information on specifying a ***location***, see Command Syntax on page 179.

The SNC-REF MO reports errors in SNI reference signals detected by the active Switch Node Clock. Descriptions of SNC-REF errors appear on the following pages. For a complete description of SNCs and SNIs, including circuit pack replacement instructions, see MOs SNI-BD (SNI Circuit Pack) on page 1667 and SNC-BD (Switch Node Clock Circuit Pack) on page 1625.

Error Log Entries and Test to Clear Value

Table 742: SNC Reference Error Log Entries

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[2]	0		Any	Any	Any	**test board** *UUCSS* **r 1**
1(a)	Any	2	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
257 (a)	Any	3	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS r 1*
513 (a)	Any	4	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
769 (a)	Any	5	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
1025 (a)	Any	6	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
1281 (a)	Any	7	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
1537 (a)	Any	8	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
1793 (a)	Any	9	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
2049 (a)	Any	13	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
2305 (a)	Any	14	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**

Table 742: SNC Reference Error Log Entries

Error Type	Aux Data	SNI Slot[1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2561 (a)	Any	15	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
2817 (a)	Any	16	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
3073 (a)	Any	17	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
3329 (a)	Any	18	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
3585 (a)	Any	19	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**
3841 (a)	Any	20	Failure audit (#777)	MAJOR	OFF	**test board** *UUCSS* **r 1**

1 The slot location of the SNI with which the SNC cannot communicate.

2 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a This error occurs when the active or standby SNC detects problems in its timing reference with an SNI circuit pack in the same carrier. The slot location of the SNI with which the SNC cannot communicate is given in the previous error table.

If duplicated SNCs exist in the carrier:

1 If the SNCs are duplicated in the carrier, use **display errors** to check the error log. If both SNCs have this error, replace the SNI that the SNCs are complaining about.

2 If the error occurred only on the standby SNC and the active SNC in the carrier does not have this error, use **reset board** to reset the standby SNC. Use **status switch-node** to show the active and standby SNCs. If the error returns after the standby has been reset, replace the standby SNC.

3 Retry the command. If this error is still in the error log, continue with the following steps.

4 If the active SNC has this error, use **set switch-node-clock** to set the standby SNC to active. If the new active SNC has this error, replace the SNI that the SNC is complaining about. Otherwise, replace the SNC that originally had this error.

If only one SNC exists in the carrier:

1 Replace the SNI that the SNC is complaining about.

2 Retry the command. If this error is still in the error log, continue with the following step.

3 Replace the SNC.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Configuration* audit (#759), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Processor Route audit (#760)		X		ND
SNC On-Board test (#778)	X	X		ND
TPN test (#779)	X	X		ND
Switch Node Clock Reset test (#780)			X	D

1 D = Destructive, ND = Nondestructive

See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for descriptions of tests and results.

SNI-BD (SNI Circuit Pack)

S8700 MC

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
SNI-BD	MAJOR	**test board *location* s**	SNI Circuit Pack
SNI-BD	MINOR	**test board *location* s**	SNI Circuit Pack
SNI-BD	WARNING	**test board *location* s**	SNI Circuit Pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

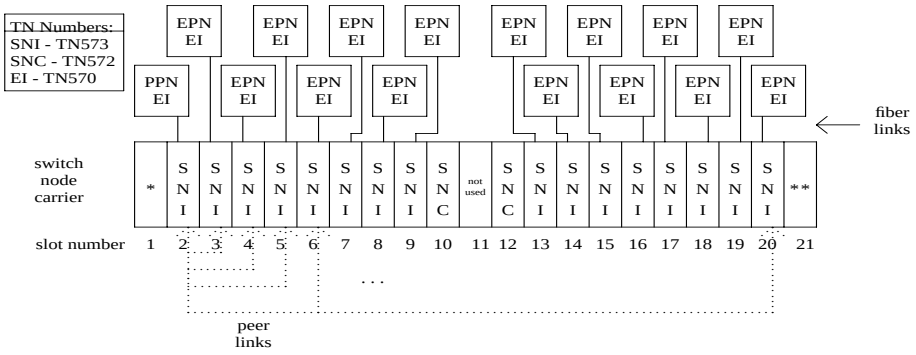
The TN573 Switch Node Interface (SNI) circuit pack is part of the Center Stage Switch (CSS) configuration. It resides in a switch node carrier that alone or with other switch nodes make up a CSS. SNIs connect to other SNIs or Expansion Interface (EI) circuit packs via fiber links. SNI-to-EI fiber links are used to connect port networks to a switch node carrier and SNI-to-SNI fiber links are used as inter-switch node fibers. In critical-reliability systems, the fiber link connections are duplicated as part of port-network connectivity (PNC) duplication. In standard- and high-reliability systems, the PNC is not duplicated.

There may be up to 16 SNIs in a switch node carrier. They are located in slots 2 through 9 and slots 13 through 20. Slot 11 in a switch node carrier is not used. One or two TN572 boards (SNCs) must reside in switch node carrier positions 10 and 12. The SNIs connect to other SNIs in the same carrier via the backplane; these connections within the same carrier are referred to as peer-links. Each SNI also connects via an optical fiber or metallic connection to another SNI in another carrier or to an EI in a port network (PN). These connections are referred to as fiber links.

The Switch Node Clock (SNC) provides timing for the SNIs in the entire carrier. When two SNCs reside in the same switch node carrier, one is in active mode and one is in standby mode. The yellow LED on the active SNC will be on solid. The yellow LED on the standby SNC will be off. See SW-CTL (Switch Control) on page 1742 for an explanation of how SNIs are involved in timing synchronization.

Figure 122, CSS Configuration with Unduplicated PNC and 1 Switch Node Carrier, on page 1668 shows an unduplicated CSS with one switch node. A single switch node can accommodate up to 16 port networks. A system with two switch nodes can accommodate up to 22 port networks. Figure 123, CSS Configuration with Duplicated PNC and 4 Switch Node Carriers, on page 1669 shows a two-switch node CSS with duplicated PNC (four switch node carriers). In this configuration, each PNC (A and B) contains two switch nodes. The cabinet numbers for the switch node carriers are typical cabinet numbers. The PNs on the top half of the figure (PNC A) are the same as the PNs on the bottom half of the figure (PNC B).

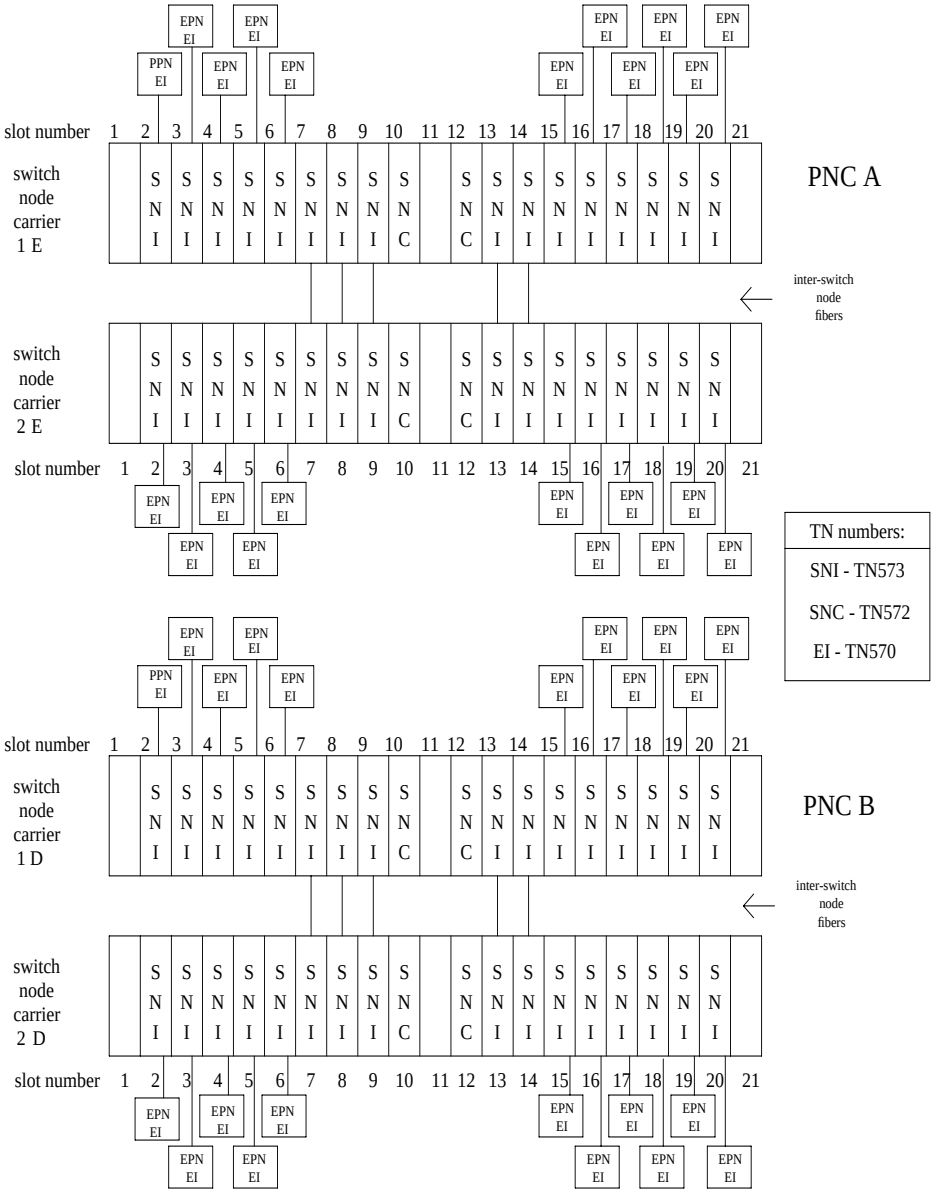
Figure 122: CSS Configuration with Unduplicated PNC and 1 Switch Node Carrier



* = An EI or a DS1C circuit pack may reside in this slot

** = A DS1C circuit pack may reside in this slot

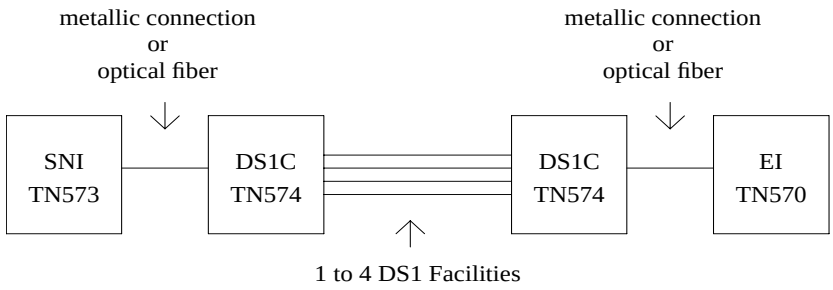
Figure 123: CSS Configuration with Duplicated PNC and 4 Switch Node Carriers



Remote PNs

A DS1 converter complex can used to provide connectivity to a remotely located port network. The DS1 converter complex consists of two TN574 DS1 converter (DS1C) circuit packs connected by 1 to 4 DS1 facilities. The DS1C complex is administered as a fiber link.

Figure 124: Fiber Link over a DS1 Converter Complex



SNI LEDs

The SNI circuit pack has red, green, and yellow LEDs. The red and green LEDs have the usual meaning, with red signifying an on-board alarm, and green signifying maintenance testing in progress. The red and green LEDs will come on and then turn off when the circuit pack is reset.

NOTE:
If the red LED is on without any alarms active against the circuit pack, replace the SNI circuit pack. This indicates that SNI firmware has detected a fault and is unable to notify software.

The yellow LED indicates status information as follows:

SNI Yellow LED states

Condition	LED on	LED off
Fiber out of Frame	0.1 second	0.1 second
In frame, No Neighbor [1]	0.5 second	0.5 second
SNI active	solid on	never off
SNI standby	never on	solid off

1 The fiber is in frame but a communication problem exists to the neighbor.

SNI Administration and SNI Board Insertion

The circuit packs in the switch node carrier will not function properly unless administration is performed first. For example, without fiber link administration, phone calls cannot be made through the CSS, CSS circuit packs will not be inserted, and maintenance software cannot test the CSS circuit packs.

For an unduplicated PNC configuration, perform the following administration, in this order, before inserting SNIs:

1 Cabinet Administration: administer the switch node carriers into the proper cabinets. When the screen is submitted, switch node numbers are assigned to the carriers. Use **list cabinet** to see the switch node numbers for the carriers.

2 Circuit Pack Administration: Every board in the switch node carriers must be administered.

3 Fiber-Link Administration: Use **add fiber-link** to administer the fibers between the TN570s and the TN573 (or TN573 to TN573), and to add a DS1C converter complex to a fiber link.

For a duplicated PNC configuration, perform the following administration, in this order, before inserting SNIs:

1 Obtain a license file to activate PNC duplication.

2 Cabinet Administration: Administer the switch node carriers and duplicate switch node carriers into the proper cabinets. When this screen is submitted, switch node numbers are assigned to the carriers. Use **list cabinet** to see the switch node numbers for the carriers.

3 Circuit Pack Administration: Every board in the switch node carriers must be administered.

4 Fiber-Link Administration: Use **add fiber-link** to administer the fibers between the TN570s and the TN573 (or TN573 to TN573), and to add a DS1C converter complex to a fiber link. If the system is being changed from an unduplicated to a duplicated PNC configuration, use **change fiber-link** to administer the b-pnc fiber-link endpoints on the existing fiber links.

5 Use **change system-parameters duplication** to administer PNC duplication.

Clear Firmware-Counters Command

SNI firmware generates error reports autonomously. This takes place independently of technician-demanded tests. Therefore, **test board *UUCSS*** clear does not affect the error status reported by firmware. The **clear firmware-counters** command clears every firmware-generated error unconditionally.

The **clear firmware-counters *UUCSS*** command sends a downlink message to the SNI circuit packs, causing them to clear out their firmware error counters and failure databases. Once the firmware failure database is cleared, the failure audit test (#777) will pass. If problems still exist, the firmware will increment its error counters and the failure audit test will begin failing again.

Do not use this command instead of the repair procedures associated with the hardware error log entries. This command may be useful if a problem was fixed and off-board alarms associated with the problem are still active.

Replacing SNI Circuit Pack—Unduplicated PNC

WARNING:

Do not power down a Switch Node carrier to replace a circuit pack.

WARNING:
Replacing a Switch Node Interface circuit pack on an unduplicated PNC disrupts service. This service effect can cause an outage of a single PN.

1. Enter **busyout board *UUCSS***.
   UUCSS represents the cabinet-carrier-slot address of the circuit pack to be replaced.
2. Replace the circuit pack.
3. Wait for the circuit pack to reset.
   Red and green LEDs will light and then go out.
4. Enter **release board *UUCSS***.

   CAUTION:
   Do not busyout any Expansion Interface circuit pack after this point.
5. Enter **test alarms long clear** for category **exp-intf**.
6. Wait 5 minutes for SNI-BD, FIBER-LK, *and* DS1C-BD alarms to clear, or enter **clear firmware-counters a-pnc**.

Replacing an SNI Circuit Pack— Duplicated PNC

WARNING:
On a system with duplicated PNC, synchronization may be provided over a combination of active and standby components. This condition is indicated by an OFF-BOARD WARNING alarm against TDM-CLK with error type 2305. Repairs to standby PNC in this state may disrupt service. If the active PNC is functional, replacement of a standby component does not disrupt service.

1. Enter **status pnc**
   Verify that the component to be replaced is on the standby PNC.
2. Enter **busyout pnc**
3. Enter **busyout board *UUCSS***
   UUCSS represents the cabinet-carrier-slot address of the circuit pack to be replaced.
4. Replace the circuit pack
5. Enter **release board *UUCSS***

   CAUTION:
   Do not busyout any Expansion Interface circuit pack after this point.
6. Enter **test alarms long clear** for category **exp-intf**.

7.	Wait 5 minutes for SNI-BD, SNI-PEER, FIBER-LK, and DS1C alarms to clear, or enter **clear firmware-counters sp 0 a-pnc | b-pnc**.	Use the letter designation of the pnc which holds the replaced component (the standby pnc).
8.	Enter **status pnc**.	If either PNC's state of health is not "functional", consult PNC-DUP (PNC Duplication) on page 1477.
9.	Enter **release pnc**.	

Switch Node Interface Manual Loop Back Procedure

This procedure is **destructive**.

Use this procedure when an SNI circuit pack cannot be tested by software. This can occur when communication between the switch node carrier and the server is down. Before using this procedure, use **test board *UUCSS* s** to run the configuration audit test (#759) on SNI circuit packs where possible. Also, use **test board *UUCSS* long** to run the processor route audit test (#760) for the active SNC in the switch node carrier. If the active SNC is not inserted, use **test hardware-group pnc *P***, where ***P*** is **a-pnc** or **b-pnc** to run test 760.

Before using this procedure, determine if more than one SNI is unable to communicate with software. Verify SNI and SNC circuit pack insertion via the **list configuration carrier *UUC*** where UUC is the cabinet and carrier location of a switch node carrier. Check for inserted SNIs and SNCs in every administered switch node carrier.

If every SNI and SNC is not inserted, then "NO BOARD" is displayed for each board in the entire PNC (either the a-pnc or the b-pnc). The link between the IPSI-connected PN's EI (on the PNC where SNI and SNC circuit packs were not inserted) and the connected SNI does not function properly. If this applies:

1. Run **test board *UUCSS*** on the IPSI-connected PN's EI, and fix any problems.
2. Perform the manual loopback procedure for the IPSI-connected PN's EI.
3. Perform the manual loopback procedure for the SNI connected to the IPSI-connected PN's EI.
4. Replace the active SNC.

If the system has a 2-level switch node carrier configuration (i.e., SNI-to-SNI fiber links exist) and the SNIs and SNCs in the second switch node carrier only (the switch node carrier that has no SNI connected to the IPSI-connected PN's EI) are not inserted and at least two SNI-to-SNI fiber links exist:

1. Run **test board *UUCSS* long** on the SNIs in the first switch node carrier that are connected to SNIs in the second switch node carrier and fix any problems.
2. Replace the active SNC.
3. Perform the manual loopback procedure for the SNIs in the second switch node carrier that are connected to SNIs in the first switch node carrier.

If software is unable to communicate with a PN's EI but can communicate with the connected SNI:

1. Run **test board *UUCSS* long** on the connected SNI and fix any problems.
2. Perform the manual loopback procedure for the PN EI.

If the connection to the SNI circuit pack is fiber, a short length of optical fiber is required for this procedure. If a metallic cable is used in the connection, remove the metallic connector from the back of the carrier, and install a lightwave transceiver in its place. The short length of optical fiber can then be used.

If this procedure is run on both endpoints on a fiber link (Expansion Interface circuit packs or Switch Node Interface circuit packs), and both check out fine, then the failure is most likely in the connection (fiber or metallic) itself if neither endpoint circuit pack is busied out, but the link remains inactive.

1 Use **busyout board *UUCSS*** to busyout the circuit pack (Expansion Interface or SNI).

2 Disconnect the transmit and receive fiber pair from the lightwave transceiver behind the circuit pack (Expansion Interface or Switch Node Interface) slot.

NOTE:
Note which is the transmit fiber and which is the receive fiber for proper re-connection at the end of this procedure. The fiber connected to the transmit side of the lightwave transceiver on one circuit pack should be connected to the receive side of the lightwave transceiver on the circuit pack on the opposite end of the fiber.

3 Using a spare fiber jumper cable, interconnect the transmit and receive jacks of the lightwave transceiver as shown in Figure 125, Interconnection of Lightwave Transceiver Transmit/Receive Jacks, on page 1675.

NOTE:
Make sure that the total length of the fiber jumper cable does not exceed the maximum length recommended for the fiber link connections between cabinets. Test the Expansion Interface or SNI circuit pack within connectivity guidelines so that test results are not influenced due to improper cable length.

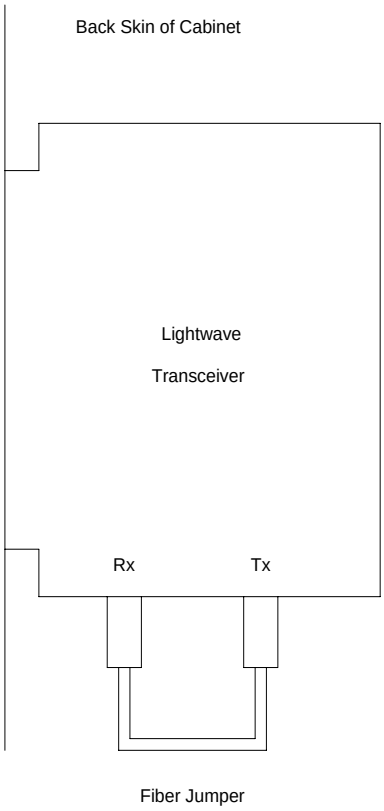
4 Go to the front of the cabinet and inspect the yellow LED.

- If the yellow LED flashes on at a rate of once per second, the Expansion Interface or Switch Node Interface circuit pack or transceiver should be replaced.
- If the yellow LED flashes on at a rate of five times per second, the circuit pack (Expansion Interface or Switch Node Interface) or the lightwave transceiver may need replacement. This may also be due to a faulty system clock on the network containing the Expansion Interface circuit pack or in the switch node carrier containing the SNI.
- If the yellow LED was blinking before starting this procedure and the yellow LED is not blinking now, this circuit pack (Expansion Interface or Switch Node Interface) and the lightwave transceiver are functioning properly.

5 Replace faulty component(s) and reconnect the original fiber. Be sure to reconnect the fibers properly as noted in Step 2.

6 Use **release board *UUCSS*** to release the Expansion Interface circuit pack or Switch Node Interface circuit pack.

Figure 125: Interconnection of Lightwave Transceiver Transmit/Receive Jacks



Error Log Entries and Test to Clear Values

Table 743: SNI Board Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **r 1**
1 (b)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	ON	**test board** *UUCSS* **r 1**
18 (c)	0	busyout board UUCSS	WARNING	OFF	**release board** *UUCSS*
125(d)		None	MINOR	ON	
257 (e)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
513 (f)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
769 (g)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
1025 (h)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	ON/ OFF	**test board** *UUCSS* **r 1**
1281 (i)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	ON	**test board** *UUCSS* **r 1**
1537 (j)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
2561 (k)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	ON	**test board** *UUCSS* **r 1**
2817 l)	any	failure audit (#777) (a)	MAJOR MINOR WARNING	ON	**test board** *UUCSS* **r 1**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its procedures.

Notes:

a The first time you see an SNI-BD error in the error log, run **test board *UUCSS***. If the failure audit test (#777) fails, enter **display errors** for this SNI circuit pack and continue with the repair procedures for SNI-BD errors.

b This error indicates that the SNI may have trouble communicating with every other SNI and SNC circuit pack in the switch node carrier.

1. Replace the SNI circuit pack.

c This error indicates that the SNI circuit pack was busied out via **busyout board *UUCSS***. To resolve this error, use **release board *UUCSS*** to release the SNI circuit pack.

d The SNI circuit pack is incompatible with the TN1654 DS1 Converter board. A TN573B or later suffix SNI board must be used when connecting to a TN1654 DS1 Converter board. Replace with a newer suffix.

e This error indicates that the SNI cannot communicate with the active SNC.

1. Use **display errors** to check the error log for other SNI circuit packs with the 257 SNI-BD error. If other SNI circuit packs in the same switch node carrier have error 257, replace the active SNC.
2. Replace this SNI.
3. Replace the active SNC in the same switch node carrier.
4. Enter **display errors.** If this error is still in the error log, follow normal escalation procedures.

f This error indicates that the SNI cannot communicate with the DS1C.

1. Perform the Fiber Fault Isolation Procedure described in Chapter 5.

g This error indicates a failure communicating synchronization control data with the active SNC.

Look at every SNI-BD error in the log via **display errors** and **display alarms** to determine whether to follow procedure 1 or procedure 2. See the table below which lists pairs of SNIs that are considered to be adjacent. Use Procedure 2 if either of the following two conditions is present:

- At least one pair of adjacent SNIs in this carrier has Error 769 with an off-board alarm logged against both SNIs in the pair.
- The active SNC in this carrier has error 257.

If neither of the above is true, follow Procedure 1.

Adjacent SNI Slot Numbers	Adjacent SNI Slot Numbers
2 & 3	13 & 14
4 & 5	15 & 16
6 & 7	17 & 18
8 & 9	19 & 20

Procedure 1 (suspect TPN link or clock generation out of lock problem):

1. Enter **display alarms** and **display errors** and follow the procedures for any on-board SNI-BD error and alarm entries.
2. If more than one SNI circuit pack in the same switch node carrier has SNI-BD error 769 with an off board alarm, replace the active SNC in the same carrier.
3. Replace this SNI.
4. Replace the active SNC in the same carrier.

Procedure 2 (suspect clock generation out of lock problem):

1. If only one SNC exists in this switch node carrier, replace the SNC. If two SNCs exist in this switch node carrier:
   a. Set the standby SNC to active by running **set switch-node-clock *UUCSS*** with the standby SNC's location.
   b. If the problem goes away, replace the SNC that was previously active. Then use **set switch-node-clock *UUCSS*** to set the SNC that was just replaced to active. If the problem returns, assume that the SNC that was just replaced is not at fault and go to step 2.
   c. If the problem persists, switch back to the previously active SNC via **set switch-node-clock** and go to step 2.
2. Replace the left-most SNI from the pair of adjacent SNIs.
3. Replace the right-most SNI from the pair of adjacent SNIs.
4. If none of the above steps cleared this error, this could be a switch node carrier backplane problem.

h This error indicates a failure communicating synchronization control data over the fiber link.

If the error is logged as an on-board error:

1. Replace the SNI circuit pack.

If the error is logged as an off-board error:

1. Enter **display errors** and follow the repair procedures for FIBER-LK errors.
2. Replace the SNI with this error.
3. Replace the fiber link's other endpoint if no DS1C complex is administered on the fiber link. Use **list fiber-link** to determine if a DS1C complex is administered. If so, replace the circuit packs in this order:
   i. Replace the DS1C circuit pack connected to this SNI.
   ii. Replace the other DS1C circuit pack.
   iii. Replace the fiber link's other endpoint.

i This error indicates a processor complex failure.

1. Replace the SNI circuit pack.

j This error indicates that excessive slips have occurred.

Follow the steps for diagnosing synchronization problems when slips have occurred in the SYNC section.

k This error indicates that the SNI cannot communicate with its neighbor. The SNI is at fault.

1. Replace the SNI circuit pack.

l This error indicates that the SNI cannot communicate with one of its peers. The SNI is at fault.

1. Replace the SNI circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Configuration* audit (#759), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Fiber Out of Frame query (#989)	X	X		ND
Packet Neighbor test (#767)	X	X		ND
Circuit Path test (#755)	X	X		ND
Destructive Facility test (#757)		X		D
Off-board Destructive Facility test (#756)		X		D
Switch Node Interface Reset test (#761)			X	D

1 D = Destructive, ND = Nondestructive

NOTE:
Test #982 is not an actual demand maintenance test. This test number is used to report results of **clear firmware-counters**. Refer to error codes for Test #777.

SNI Circuit Path Test (#755)

This test is nondestructive. It performs a nondestructive test of the circuit path.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received incorrect message data from the SNI circuit pack. **1** Retry the command at 1-minute intervals up to 3 times.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
2303	ABORT	The SNI circuit pack responded that software test requested is not valid. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.

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Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
102	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 2 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 2. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1. If other SNI circuit packs have SNI-PEER error type 1, then replace the SNI in slot 2. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** If other SNI circuit packs do not have SNI-PEER error type 1 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **4** Replace this SNI. **5** Replace the SNI in slot 2.
103	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 3 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 3. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 257. If other SNI circuit packs have SNI-PEER error type 257, then replace the SNI in slot 3. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 257 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace this SNI. **4** Replace the SNI in slot 3.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
104	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 4 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 4. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 513. If other SNI circuit packs have SNI-PEER error type 513, then replace the SNI in slot 4. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 513 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 4.
105	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 5 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 5. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 769. If other SNI circuit packs have SNI-PEER error type 769, then replace the SNI in slot 5. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 769 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 5.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
106	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 6 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 6. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1025. If other SNI circuit packs have SNI-PEER error type 1025, then replace the SNI in slot 6. Replacing an SNI may be service interrupting. See the SNI-BD section for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1025 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 6.
107	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 7 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 7. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1281. If other SNI circuit packs have SNI-PEER error type 1281, then replace the SNI in slot 7. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1281 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 7.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
108	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 8 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 8. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1537. If other SNI circuit packs have SNI-PEER error type 1537, then replace the SNI in slot 8. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1537 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 8.
109	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 9 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 9. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1793. If other SNI circuit packs have SNI-PEER error type 1793, then replace the SNI in slot 9. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1793 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 9.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
113	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 13 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 13. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2049. If other SNI circuit packs have SNI-PEER error type 2049, then replace the SNI in slot 13. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2049 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 13.
114	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 14 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 14. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2305. If other SNI circuit packs have SNI-PEER error type 2305, then replace the SNI in slot 14. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2305 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 14.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
115	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 15 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 15. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2561. If other SNI circuit packs have SNI-PEER error type 2561, then replace the SNI in slot 15. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2561 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 15.
116	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 16 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 16. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2817. If other SNI circuit packs have SNI-PEER error type 2817, then replace the SNI in slot 16. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2817 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 16.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
117	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 17 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 17. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3073. If other SNI circuit packs have SNI-PEER error type 3073, then replace the SNI in slot 17. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3073 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 17.
118	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 18 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 18. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Then follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3329. If other SNI circuit packs have SNI-PEER error type 3329, then replace the SNI in slot 18. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3329 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 18.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
119	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 19 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 19. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3585. If other SNI circuit packs have SNI-PEER error type 3585, then replace the SNI in slot 19. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3385 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 19.
120	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 20 over the circuit path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 20. Use **display errors** to find any SNI-BD errors and check **display alarms** to see if the errors have on-board alarms. Follow the repair procedures for SNI-BD. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3841. If other SNI circuit packs have SNI-PEER error type 3841, then replace the SNI in slot 20. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3841 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. Proceed as follows: **3** Replace this SNI. **4** Replace the SNI in slot 20.

Table 744: TEST #755 SNI Circuit Path Test

Error Code	Test Result	Description / Recommendation
122	FAIL	The SNI circuit pack cannot communicate with its neighbor via the circuit path. **1** Fix any on-board errors (SNI-BD, EXP-INTF, and/or DS1C-BD) against the components of this fiber link by using **display errors** and **display alarms** and following the repair procedures. (Use the **list fiber-link** command to find the fiber link associated with this SNI. The **display fiber-link** command can then be used to find the endpoints of the fiber link and the DS1C circuit pack locations if this fiber link has a DS1 Converter complex administered.) **2** Enter **display errors** and follow the repair procedures for any FIBER-LK entries for the fiber this SNI is administered on. Check **list fiber-link** to determine the administered fiber. **3** If this fiber link has a DS1 converter complex administered, enter **display errors** and **display alarms** and follow the repair procedures for any off-board DS1C-BD or DS1-FAC entries for either of the DS1C boards administered or for the DS1 facilities associated with either of the DS1C boards administered. **4** Replace this SNI.
	PASS	The SNI passed the sni circuit path test.
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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SNI Off-Board Destructive Facility Test (#756)

This test is **destructive**.

The SNI runs a destructive loop around of the on-board and off-board Looparound. This test returns the result of the off-board loop around, while Test #757 returns the result of the on-board loop around.

Table 745: TEST #756 SNI Off-Board Destructive Facility Test

Error Code	Test Result	Description / Recommendation
1015	ABORT	The system will not allow this test to be run because the SNI circuit pack has not been busied out. Use **busyout board** to busyout the SNI circuit pack. Repeat **test board *UUCSS* long**.
1415	ABORT	The lightwave transceiver is absent. **1** If a lightwave transceiver should not be present, do nothing. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. This test can only be run when a lightwave transceiver exists. **2** Otherwise, check the lightwave transceiver connections. **3** If OK, replace the lightwave transceiver. If a fiber out of frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. **4** If the test continues to abort, replace the SNI circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 745: TEST #756 SNI Off-Board Destructive Facility Test *Continued*

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.
127	FAIL	The data is not correctly looped around. **1** Check the lightwave transceiver or metallic physical connections. **2** If connections OK, replace the lightwave transceiver or the metallic interconnect. **3** If the test still fails, replace the SNI circuit pack.
	PASS	No problems associated with this test are detected on the SNI.
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

SNI Destructive Facility Test (#757)

This test is **destructive**.

The SNI runs a destructive loop around of the off-board and on-board loop around. This test returns the result of the on-board loop around, while test 756 returns the result of the off-board loop around.

Table 746: TEST #757 SNI Destructive Facility Test

Error Code	Test Result	Description / Recommendation
1015	ABORT	The system will not allow this test to be run because the SNI circuit pack has not been busied out. Busyout the SNI circuit pack with **busyout board**. Repeat **test board *UUCSS* long**.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 746: TEST #757 SNI Destructive Facility Test

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to software test requests. **1** Run the **test led switch-node** for the switch node where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.
127	FAIL	The data is not correctly looped around. **1** Replace the SNI circuit pack.
	PASS	No problems associated with this test are detected on the SNI.
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

Configuration Audit (#759)

This test is nondestructive.

NOTE:
For descriptions of result codes for this test see:

- "SNC-BD (Switch Node Clock Circuit Pack)" when the circuit pack tested is a Switch Node Clock (circuit pack slots 10 or 12).
- "SNI-BD (SNI Circuit Pack)" when the circuit pack tested is a Switch Node Interface (circuit pack slots 2–9 or 13–20).

Use **test board short** or **test board long** to run this test for SNI circuit packs or SNC circuit packs.

For SNI circuit packs, this test queries the SNI for SNCs in the same switch node carrier, SNI peers, DS1Cs, and EI or SNI neighbors that the SNI can communicate with and compares this data to the administered data.

For SNC circuit packs, this test queries the SNC for SNCs and SNIs in the same switch node carrier that the SNC can communicate with and compares this data to the administered data.

Failures of this test cause entries in the error and alarm logs against Switch Node Configuration (SN-CONF) with the board location of the SNI or SNC.

Incorrectly Connected Administered Fibers

Some physically connected fibers that do not match fiber administration can cause port network problems that are not detected and alarmed by PNC tests. The symptoms may be many phone calls not working correctly, and port network component alarms because of translation mismatches.

This test is unable to detect when an SNI is connected to the same type of board (EI or SNI) as administered, but is located in a different cabinet but the same carrier and same slot as the administered fiber endpoint. Use **list fiber-link** to see the administered fiber endpoint. This test can only detect if the fiber endpoint connected to the SNI is in a different carrier, slot location than the administered fiber endpoint.

Incorrectly Connected Administered SNI-to-EI Fibers

If the SNI is connected to the same type of fiber endpoint as the administered fiber endpoint, but the location is the same as administered except for the cabinet, many phone calls will not work correctly. Some phone calls will not go through and some phone calls will ring the wrong phone.

Use **test led** to check connectivity.

1. Run **test led port-network** on each administered port network and verify that the LEDs on the correct port network are lit.
2. If they are not lit, check that the fiber connections to the port network are consistent with the administered fibers (**list fiber-link**) that does not light the LEDs as expected.
3. Run **test led switch-node** on each administered switch node carrier and verify that the LEDs on the correct carrier are lit.
4. If they are not, check the connectivity to the switch node carrier that does not light the LEDs as expected.

Incorrectly Connected Administered SNI-to-SNI Fibers between Three Switch Nodes

If the system has more than 2 switch nodes, SNI-to-SNI fibers administered between 2 switch nodes could be incorrectly connected to a third switch node. This is a problem that could occur during installation or when inter-switch node fibers are changed. For multiple fibers to a distant switch node, an incorrect connection would not appear as a problem unless this fiber is used for a system-link to a port network connected to the distant switch node. Use **status sys-link** to see the boards and fiber links in the path from an IPSI-connected PN to a specific port network. A specific SNI-to-SNI fiber connection must be in the system-link path to be checked with the port network LED test.

One method to force an SNI-to-SNI fiber connection to be used as a system-link is to physically remove every SNI-to-SNI connection except the fiber link being tested at the distant switch node by physically removing SNI boards in the distant switch node.

1. Use **status sys-link** to verify that this fiber selected for test is in the path to the PN connected to the distant switch node that will be used for the LED test.
2. Run **test led** to a port network as described above to verify this fiber connection.
3. Repeat this procedure for each of the other SNI-to-SNI fibers terminating on this distant switch node.

Another method for testing multiple fiber connections to a distant switch node is described below.

1. Use **list fiber-link** to see the number of SNI-to-SNI fibers that are administered to and terminating on this switch node.
2. Run **test led port-network** on a PN connected to this distant switch node, and verify that the LEDs on the correct PN are lit.
3. Use **status sys-link** and select the active EI in the IPSI-connected PN connected to the distant switch node being tested. This shows the path from the IPSI-connected PN and the SNI-to-SNI fiber being used in this path.
4. If the port network LEDs are lit and multiple SNI-to-SNI fibers connect to this distant switch node, physically remove the SNI that is listed in the path.

   If not lit, check that the fiber connections to the PN are consistent with the administered fibers (**list fiber-link**) that do not light the LEDs as expected.
5. Use **status sys-link** to see the new path from the IPSI-connected PN to the this distant switch.
6. Run **test led port-network** on a PN connected to the distant switch node and verify that the LEDs on the correct PN are lit.
7. Repeat steps 4 – 6 until the last SNI-to-SNI fiber to this distant switch node has been tested.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run **test led switch-node** for the switch node where this board resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS*** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
102	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 2. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 1, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 1, replace the SNI in slot 2. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
103	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 3. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 257, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 257, replace the SNI in slot 3. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
104	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 4. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 513, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 513, replace the SNI in slot 4. Replacing an SNI may be service interrupting. See"SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
105	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 5. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 769, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 769, replace the SNI in slot 5. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
106	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 6. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 1025, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 1025, replace the SNI in slot 6. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
107	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 7. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 1281, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 1281, replace the SNI in slot 7. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
108	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 8. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 1537, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 1537, replace the SNI in slot 8. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
109	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 9. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 1793, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 1793, replace the SNI in slot 9. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
112	FAIL	The SNI circuit pack cannot communicate with the active SNC. **1** Check the error log for other SNI circuit packs in the same carrier with a 257 SNI-BD error. Use **display errors** with category PNC to view SNI-BD errors. If other SNI circuit packs in the same switch node carrier have error 257, then replace the active SNC in this switch node carrier. Replacing an SNC may be service interrupting. See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for the procedure for replacing an SNC. If other SNI circuit packs in the same carrier do not have SNI-BD error type 257 logged, proceed to step 2. **2** Replace this SNI. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** Replace the active SNC in the same switch node carrier. Replacing an SNC may be service interrupting. See "SNC-BD (Switch Node Clock Circuit Pack)" on page 1625 for the procedure for replacing an SNC.
113	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 13. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 2049, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 2049, replace the SNI in slot 13. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
114	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 14. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 2305, replace the SNI being tested. Replacing an SNI may be service interrupting. See ''SNC-BD (Switch Node Clock Circuit Pack)'' on page 1625 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 2305, replace the SNI in slot 14. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. Retry the command.
115	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 15. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 2561, replace the SNI being tested. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 2561, replace the SNI in slot 15. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. Retry the command.
116	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 16. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 2817, replace the SNI being tested. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 2817, replace the SNI in slot 16. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. Retry the command.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
117	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 17. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 3073, replace the SNI being tested. Replacing an SNI may be service interrupting. See"SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 3073, replace the SNI in slot 17. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
118	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 18. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 3329, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 3329, replace the SNI in slot 18. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.
119	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 19. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 3585, replace the SNI being tested. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 3585, replace the SNI in slot 19. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. Retry the command.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
120	FAIL	The SNI circuit pack cannot communicate with the equipped SNI in slot 20. **1** Perform the Fiber Fault Isolation Procedure described in Chapter 5. This will resolve multiple SNI-PEER errors. **2** If the SNI being tested has SNI-PEER error type 3841, replace the SNI being tested. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. To view SNI-PEER errors, use **display errors** with category PNC-PEER. Retry the command. **3** If the SNI being tested has SNI-PEER error type 3841, replace the SNI in slot 20. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. Retry the command.
133	FAIL	No neighbor link is administered, but the SNI has an EI neighbor. **1** Administer the SNI on a fiber link to the EI neighbor it is connected to via **add fiber-link next**. Or remove both fiber endpoints (i.e., this SNI and its EI neighbor) and remove the fiber endpoints from circuit pack administration via **change circuit-pack**.
134	FAIL	No neighbor link is administered, but the SNI has an SNI neighbor. **1** Administer the SNI on a fiber link to the SNI neighbor it is connected to via **add fiber-link next**. Or remove both fiber endpoints (i.e., this SNI and its SNI neighbor) and remove the fiber endpoints from circuit pack administration via **change circuit-pack**.
135	FAIL	The SNI circuit pack cannot communicate with its neighbor. The SNI has an administered neighbor, but cannot communicate with its neighbor. **1** Check if the administered neighbor is inserted. If not, insert the neighbor circuit pack. **2** Perform the Fiber Fault Isolation Procedure described in Chapter 5.
136	FAIL	The SIN's administered neighbor does not match the physical neighbor connected. The type of neighbor administered is an SIN and the type of neighbor physically connected is an EI. Enter **list fiber-link**, and verify that the fiber-optic and metallic cable connections are installed as administered.
137	FAIL	The SNI's administered neighbor does not match the physical neighbor connected. The type of neighbor administered is an EI and the type of neighbor physically connected is an SNI. Enter **list fiber-link**, and verify that the fiber-optic cable and metallic cable connections are installed as administered.

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Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
138	FAIL	The physical neighbor location does not match administered neighbor location. The carrier and slot of the administered neighbor do not match the carrier and slot of the physical neighbor. Enter **list fiber-link**, and verify that the fiber-optic cable and metallic cable connections are installed as administered. If the problem does not seem to be caused by a physical connection problem or an administration problem, replace the neighbor circuit pack. It is possible for the neighbor circuit pack to have a hardware problem that causes it to report a wrong angel address (physical carrier/slot address) to software.
139	FAIL	The SNI is administered as connected to a DS1C but is not physically connected to a DS1C. *If a DS1C is not supposed to be connected to this SNI*, change administration to remove the DS1 converter complex from the fiber link associated with this SNI: **1** Use **list fiber-link** to determine the fiber associated with the SNI. **2** Use **remove fiber-link** to remove the fiber. **3** Use **add fiber-link** to add the fiber back, and do not administer the DS1 converter complex at this time.
140	FAIL	The SNI is physically connected to a DS1C but is not administered to be connected to a DS1C. Either add the DS1 converter complex to the fiber that this SNI is associated with by: **1** Use **list fiber-link** to determine the fiber associated with the SNI. **2** Use **remove fiber-link** to remove the fiber. **3** Use **add fiber-link** to add the fiber back, and administer the DS1 converter complex. **Or**: **1** Remove the DS1C connection, and connect the SNI directly to its administered fiber endpoint. **2** Verify that the fiber-optic and metallic cable connections are installed as administered by entering **list fiber-link**.
	PASS	The administered data and the circuit packs the SNI can communicate with match.

Table 747: TEST #759 Configuration Audit

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use the **reset board** command if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore the **reset board** command can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Switch Node Interface Reset Test (#761)

This test is **destructive**.

This test resets the SNI circuit pack via **reset board *UUCSS*** when an SNI circuit pack's location is entered. The SNI is reset via the active SNC circuit pack in the carrier. If the SNI is connected to an IPSI-connected PN's EI, the SNI is reset via its IPSI-connected PN's EI neighbor. If an SNI with a non-IPSI-connected PN's EI or another SNI as its neighbor cannot be reset via the active SNC (i.e., if no software communication exists between the active SNC and the server), an attempt will be made to reset the SNI via its neighbor.

An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use the **reset board** command if the SNI circuit pack gets into a mode where it cannot communicate with software.

If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore the **reset board** command can mask real problems.

Table 748: TEST #761 Switch Node Interface Reset Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 748: TEST #761 Switch Node Interface Reset Test

Error Code	Test Result	Description / Recommendation
2302	ABORT	Software received incorrect message data from the SNI circuit pack. **1** Retry the command at 1-minute intervals up to 3 times.
2303	ABORT	The SNI circuit pack responded that the software test requested is invalid. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.
2316	ABORT	The reset of the SNI circuit pack was attempted via the connected DS1C circuit pack. This ABORT code indicates that the fiber is not administered, but in this particular case it also indicates a software problem. **1** Retry the command at 1-minute intervals up to 1 time.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.

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Table 748: TEST #761 Switch Node Interface Reset Test

Error Code	Test Result	Description / Recommendation
	PASS	The "reset" message was sent out successfully to the active SNC or to the SNI's neighbor. A PASS does not necessarily mean the SNI circuit pack was successfully reset. The reset can be verified by checking that the red and green LEDs turn on and then turn off. If an SNI circuit pack fails one of the firmware tests run during its reset sequence, the red LED will stay on and the circuit pack should be replaced.
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use the **reset board** command if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore the **reset board** command can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

Packet Neighbor Link Test (#767)

This test is nondestructive.

This test checks the packet path of the neighbor circuit pack and the peer circuit packs. A packet is sent from the SNI being tested to the peer SNIs and to the neighbor EI or SNI. If the other EI or SNI sends the same data back in the packet, this test passes. Otherwise, this test fails.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2302	ABORT	Software received incorrect message data from the SNI circuit pack. **1** Retry the command at 1-minute intervals up to 3 times.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
2303	ABORT	The SNI circuit pack responded that the software test requested is invalid. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI firmware is not able to run the test. For this particular test, the SNI circuit pack must be able to communicate with its neighbor. **1** Verify that the SNI can communicate with its neighbor by checking the yellow LED of the SNI to make sure the SNI is in frame, or by running **test board** for the SNI and checking test 989 for fiber out-of-frame. If the results of Test 989 indicate that the fiber is out-of-frame, follow the recommendation associated with the test failure. If a DS1 converter complex exists on the fiber link, enter **display errors** and follow the repair procedures for any DS1C-BD and DS1-FAC entries. **2** Retry the command at 1-minute intervals up to 3 times.
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node carrier where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.

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Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
102	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 2 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 2. Use the **display errors** command to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1. If other SNI circuit packs have SNI-PEER error type 1 errors, replace the SNI in slot 2. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 2.
103	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 3 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 3. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 257. If other SNI circuit packs have SNI-PEER error type 257 errors, replace the SNI in slot 3. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 257 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 3.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
104	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 4 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 4. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 513. If other SNI circuit packs have SNI-PEER error type 513 errors, replace the SNI in slot 4. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 513 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 4.
105	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 5 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 5. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 769. If other SNI circuit packs have SNI-PEER error type 769 errors, replace the SNI in slot 5. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 769 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 5.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
106	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 6 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 6. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1025. If other SNI circuit packs have SNI-PEER error type 1025 errors, replace the SNI in slot 6. Replacing an SNI may be service interrupting. See"SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1025 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 6.
107	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 7 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 7. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1281. If other SNI circuit packs have SNI-PEER error type 1281 errors, replace the SNI in slot 7. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1281 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 7.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
108	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 8 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 8. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1537. If other SNI circuit packs have SNI-PEER error type 1537 errors, replace the SNI in slot 8. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1537 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 8.
109	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 9 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 9. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 1793. If other SNI circuit packs have SNI-PEER error type 1793 errors, replace the SNI in slot 9. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 1793 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 9.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
113	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 13 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 13. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2049. If other SNI circuit packs have SNI-PEER error type 2049 errors, replace the SNI in slot 13. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2049 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 13.
114	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 14 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 14. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2305. If other SNI circuit packs have SNI-PEER error type 2305 errors, replace the SNI in slot 14. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2305 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 14.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
115	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 15 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 15. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2561. If other SNI circuit packs have SNI-PEER error type 2561 errors, replace the SNI in slot 15. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2561 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 15.
116	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 16 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 16. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 2817. If other SNI circuit packs have SNI-PEER error type 2817 errors, replace the SNI in slot 16. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 2817 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 16.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
117	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 17 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 17. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3073. If other SNI circuit packs have SNI-PEER error type 3073 errors, replace the SNI in slot 17. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3073 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 17.
118	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 18 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 18. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3329. If other SNI circuit packs have SNI-PEER error type 3329 errors, replace the SNI in slot 18. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3329 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 18.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
119	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 19 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 19. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3585. If other SNI circuit packs have SNI-PEER error type 3585 errors, replace the SNI in slot 19. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3585 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 19.
120	FAIL	The SNI circuit pack cannot communicate with the SNI in slot 20 over the packet path. **1** Fix any on-board SNI-BD errors against this SNI and the SNI in slot 20. Use **display errors** to find any SNI-BD errors and use the display alarms command to determine whether the errors have on-board alarms. Then, follow the repair procedures for the SNI-BD as described in the Maintenance manual. **2** Use **display errors** to check the error log for other SNI circuit packs with SNI-PEER error type 3841. If other SNI circuit packs have SNI-PEER error type 3841 errors, replace the SNI in slot 20. Replacing an SNI may be service interrupting. See "SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. If other SNI circuit packs do not have SNI-PEER error type 3841 errors, the problem could be at either of the peer SNI boards. It is arbitrary as to which SNI is replaced first. **3** Replace the SNI being tested. **4** Replace the SNI in slot 20.

Table 749: TEST #767 Packet Neighbor Link Test

Error Code	Test Result	Description / Recommendation
123	FAIL	The SNI circuit pack cannot communicate with its neighbor via the packet path. **1** Fix any on-board errors (SNI-BD, EXP-INTF, and/or DS1C-BD) against the components of this fiber link by using **display errors** and **display alarms** and following the repair procedures. Use **list fiber-link** to find the fiber link associated with this SNI. Use **display fiber-link** to find the endpoints of the fiber link and the DS1C circuit pack locations if this fiber link has a DS1 Converter complex administered.) **2** Enter **display errors** and **display alarms** and follow the repair procedures for any SNC-BD error entries with corresponding on-board alarm entries. **3** Enter **display errors** and follow the repair procedures for any SYNC entries. **4** If this FIBER-LK has circuit, packet, and control path errors, check the lightwave transceiver connections or metallic connections. Use the LED states to verify whether the connections are correct. Also, a test fiber-link s command can be run to determine whether a fiber out of frame condition exists on the fiber link; the SNI Fiber Out-of-Frame Query (#989) reports whether a fiber out of frame condition exists for an SNI endpoint and the Expansion Interface Fiber Out-of-Frame Query test (#238) reports whether a fiber out of frame condition exists for an Expansion Interface endpoint. **5** Replace the lightwave transceivers if present. **6** Replace one of the endpoint boards. **7** Replace the other endpoint board. **8** Replace the DS1 converter circuit packs if a DS1 converter converter complex is administered on this fiber.
	PASS	The SNI can communicate with the peer SNIs and the neighbor over the packet path.
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

Failure Audit (#777)

This test is nondestructive.

This test queries an SNC for any existing failures and any unacknowledged “cleared failure” messages. Each failure generates an error and alarm entry against SNC-BD, SNC-LINK, or SNC-REF. A “cleared failure” message is a message an SNI circuit pack sends to software indicating the resolution of a previous failure. This message is “unacknowledged” if the SNI circuit pack never receives a response from software indicating it’s own receipt of the original “cleared failure” message.

If no failures are detected by the SNI circuit pack, this test will pass.

If this test reports failures, **test board** shows **FAIL** with no FAIL code. Use **display errors** with category PNC to show the error log and see every SNI-BD and FIBER-LK error. Use **display errors** with category PNC-PEER to view every SNI-PEER error.

Table 750: TEST #777 Failure Audit

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 750: TEST #777 Failure Audit

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See"SNI-BD (SNI Circuit Pack)" on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.
	FAIL	The SNI circuit pack reported failures or retransmitted a "cleared failure" message. **1** If this is the first time this test was run, run the test again. If there were any previous failure messages that software did not acknowledge, this test will FAIL even if the failure messages indicate a FAIL to PASS transition (i.e., a problem has gone away). If this test is run twice and FAILs both times, then at least one problem still exists. **2** Fix any SNI-BD, SNI-PEER, and FIBER-LK errors by following the repair procedures. Use **display errors** and **display alarms** with category PNC for SNI-BD and FIBER-LK and category PNC-PEER for SNI-PEER. Fix any problems found by referring to the SNI Board or SNI Peer Error Log Entries tables in this section or Fiber Link Error Log Entries tables in the FIBER-LK (Fiber Link) on page 977 section. **3** If no SNI-BD, SNI-PEER, or FIBER-LK entries exist in the error and alarm logs, retry the command.
	PASS	No problems are detected on the board.

Table 750: TEST #777 Failure Audit

Error Code	Test Result	Description / Recommendation
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

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Clear Firmware-Counters (#982)

This test number is used to report unsuccessful results of **clear firmware-counters**. This is not an actual demand maintenance test. If the command aborts, refer to the error codes listed for Test #777.

SNI Fiber Out of Frame Query (#989)

This test is nondestructive.

The SNI circuit pack reports whether a fiber out of frame condition exists, whether a loss of signal condition exists, and whether the lightwave transceiver is present.

Table 751: TEST #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 751: TEST #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
1415	ABORT	The lightwave transceiver is absent. **1** If a lightwave transceiver should not be present, do nothing. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. **2** Otherwise, check the lightwave transceiver connections. **3** If OK, replace the lightwave transceiver. If a fiber out of frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. **4** If the test continues to abort, replace the SNI circuit pack.
2300	ABORT	The downlink message necessary to run this test could not be sent. **1** Retry the command at 1-minute intervals up to 3 times.
2301	ABORT	The software timer could not be set before sending the downlink message necessary to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2304	ABORT	SNI circuit pack responded that it is not able to run the test requested by software. **1** Retry the command at 1-minute intervals up to 3 times.

Table 751: TEST #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
2306	ABORT	The SNI circuit pack is not responding to test requests sent by software. **1** Run the **test led switch-node** for the switch node where the SNI resides to verify whether the LEDs on the board light. **2** If the LEDs on the other boards in the carrier light, but the LEDs on this board do not light, run test 760 via **test board *UUCSS* l** for the active SNC in this carrier. Wait 5 minutes and then try step 1 one more time. If the LEDs on this board still do not light, replace this board. Replacing an SNI may be service interrupting. See ''SNI-BD (SNI Circuit Pack)'' on page 1667 for the procedure for replacing an SNI. **3** If none of the LEDs light for the boards in the same carrier as this board, fix any problems associated with the connectivity of this carrier to the server. **a** Check **list fiber-link** to see the fiber connections to this carrier. **b** Check the LEDs on every SNI and EI, and fix any fiber problems. **c** Enter **display errors**, and follow the repair procedures for any EXP-INTF error entries associated with the controlling IPSI-connected PN. **d** Follow the repair procedures for any SYNC, SNI-BD, SNC-BD, FIBER-LK, or SNI-PEER error entries. **4** Follow the procedure described above, SNI Manual Loopback to determine whether the circuit pack or the fiber connection is faulty.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
141	FAIL	The SNI circuit pack has a fiber out of frame condition, but no loss of signal condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered (check via **list fiber-link**). Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. **2** Perform the Fiber Fault Isolation Procedure described in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 751: TEST #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
142	FAIL	The SNI circuit pack has a fiber out-of-frame condition, but no loss of signal condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered (check via **list fiber-link**). Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. **2** If a lightwave transceiver is not supposed to be present, go to step 2. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. Otherwise, check the lightwave transceiver connections. If OK, replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. **3** Perform the Fiber Fault Isolation Procedure described in Chapter 5. **4** Replace this SNI circuit pack. **5** Replace the connected circuit pack.
143	FAIL	The SNI circuit pack has a loss of signal condition, but no fiber out of frame condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered (check via **list fiber-link**). Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. **2** Perform the Fiber Fault Isolation Procedure described in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 751: TEST #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
144	FAIL	The SNI circuit pack has a loss of signal condition, but no fiber out of frame condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered (check via **list fiber-link**). Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. **2** If a lightwave transceiver is not supposed to be present, go to step 2. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. Otherwise, check the lightwave transceiver connections. If OK, replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. **3** Perform the Fiber Fault Isolation Procedure described in Chapter 5. **4** Replace this SNI circuit pack. **5** Replace the connected circuit pack.
145	FAIL	The SNI circuit pack has a fiber out of frame condition and a loss of signal condition. Also, a lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered (check via **list fiber-link**). Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. **2** Perform the Fiber Fault Isolation Procedure described in Chapter 5. **3** Replace this SNI circuit pack. **4** Replace the connected circuit pack.

Table 751: TEST #989 SNI Fiber Out of Frame Query

Error Code	Test Result	Description / Recommendation
146	FAIL	The SNI circuit pack has a fiber out of frame condition, and a loss of signal condition. Also, no lightwave transceiver is connected to the SNI circuit pack. **1** Check that the connected circuit pack is physically installed. The connected circuit pack is the other endpoint of the fiber-link if no DS1C complex is administered (check via **list fiber-link**). Otherwise, if a DS1C complex is administered, the connected circuit pack is the DS1C circuit pack connected to the SNI circuit pack. **2** If a lightwave transceiver is not supposed to be present, go to step 2. For example, an SNI connected to a DS1C circuit pack or an SNI with a metallic connection does not have a lightwave transceiver. Otherwise, check the lightwave transceiver connections. If OK, replace the lightwave transceiver. If a fiber out-of-frame condition exists and lightwave transceivers are used, check that the lightwave transceivers are of the same type, that is, both are 9823a or both are 9823b. If they are not the same type, replace one of the lightwave transceivers: • 9823a is used for distances up to 4900 feet. • 9823b is used for distances up to 25,000 feet. **3** Perform the Fiber Fault Isolation Procedure described in Chapter 5. **4** Replace this SNI circuit pack. **5** Replace the connected circuit pack.
	PASS	No problems associated with this test are detected on the SNI.
0	NO BOARD	No board was detected by the test. **1** Check that board is properly translated and inserted. **2** Run the test again. If it fails, reset the board. An SNI should be reset instead of reseating the circuit pack. The **reset board** command should almost never be used on an SNI. It may be necessary to use **reset board** if the SNI circuit pack gets into a mode where it cannot communicate with software. If an SNI with active errors and alarms is reset, the errors and alarms may take a while to come back, therefore **reset board** can mask real problems. **3** Run the test again. If it fails, the ID chip on board may be bad. Replace the board and retest.

SNI-PEER (SNI Peer Link)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
SNI-PEER	MAJOR	**test board *location* s**	SNI Peer Link
SNI-PEER	MINOR	**test board *location* s**	SNI Peer Link
SNI-PEER	WARNING	**test board *location* s**	SNI Peer Link

1 For information on specifying a ***location***, see Command Syntax on page 179.

SNI Peers are Switch Node Interfaces residing on the same Switch Node Carrier. SNI-PEER maintenance involves testing of the links between SNI Peers. SNI-PEER errors are described on the following pages. For a full description of SNIs, including circuit pack replacement, see SNI-BD (SNI Circuit Pack) on page 1667.

Error Log Entries and Test to Clear Values

Table 752: SNI-PEER Hardware Error Log Entries

Error Type	Aux Data	SNI Slot [1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[2]	0		Any	Any	Any	**test board** *UUCSS* **r 1**
1	any	2	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
257	any	3	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
513	any	4	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
769	any	5	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
1025	any	6	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
1281	any	7	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board UUCSS r 1**

Table 752: SNI-PEER Hardware Error Log Entries

Error Type	Aux Data	SNI Slot [1]	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1537	any	8	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS r 1*
1793	any	9	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
2049	any	13	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
2305	any	14	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
2561	any	15	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
2817	any	16	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
3073	any	17	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
3329	any	18	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
3585	any	19	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**
3841	any	20	Failure audit (#777)	MAJOR MINOR WARNING	OFF	**test board** *UUCSS* **r 1**

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 The slot location of the SNI at the other end of the peer link indicted by the SNI reporting the error.

Notes:

For every error in Table 752, the SNI circuit pack reporting the error indicates that it has a problem with the control path, circuit path, or packet path to the SNI peer in the slot indicated on the error table.

Run the Failure Audit test (#777) to confirm if the error still exists.

If the SNI reports an SNI-PEER error against a slot that does not contain an SNI, either change circuit pack administration via **change circuit-pack** to unadminister the SNI, or insert an SNI into the indicated slot. Use **list configuration carrier** to determine if an SNI circuit pack is inserted. Otherwise, use **display errors** and look at every SNI-PEER error in the log. If either of the following two conditions are present, follow Procedure 2 below.

- Do many SNIs have SNI-PEER errors pointing to the same 2 adjacent SNIs?
- Do 2 adjacent SNIs have SNI-PEER errors pointing to many other SNIs?

If neither condition is present, follow Procedure 1 below. When using either procedure, see "SNI-BD (SNI Circuit Pack)" or "SNC-BD (Switch Node Clock Circuit Pack)" for circuit pack replacement instructions.

Slot Numbers of Adjacent SNIs	Point to This SNI Pair
2, 3	1, 257
4, 5	513, 769
6, 7	1025, 1281
8, 9	1537, 1793
13, 14	2049, 2305
15, 16	2561, 2817
17, 18	3073, 3329
19, 20	3585, 3841

Procedure 1: Proceed through the following steps until the problem is resolved:

1. Perform the Fiber Fault Isolation Procedure described in Chapter 5.
2. Replace the SNI pointed to by the SNI-PEER error type (see the SNI Slot column in *Table 752, SNI-PEER Hardware Error Log Entries,* on page 1725, "SNI-PEER Hardware Error Log Entries").
3. Replace the SNI reporting the SNI-PEER error.
4. Replace the active SNC.

Procedure 2: If either of the two patterns described before are present, then the clock signal between active SNC and 2 Adjacent SNIs is suspect. Proceed through the following steps *until* the problem is resolved:

1. If only one SNC exists in this switch node carrier, replace the SNC. If two SNCs exist in this switch node carrier, perform the following steps:
   a. Set the standby SNC to active by executing **set switch-node-clock** UUCSS with the standby SNC's location.
   b. If the problem persists, switch back to the previously active SNC via **set switch-node-clock** and go to step 2 below.
   c. If the problem went away, replace the SNC that was previously active. Then set the newly replaced SNC to active. If the problem returns, assume that the SNC that was just replaced was not at fault and go to step 2 below.
2. Replace the left-most SNI from the pair of adjacent SNIs.

3 Replace the right-most SNI from the pair of adjacent SNIs.

4 This could indicate a problem with the switch-node-carrier backplane.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Configuration* audit (#759), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Configuration audit (#759)	X	X		ND
Failure audit (#777)	X	X		ND
Fiber Out of Frame query (#989)	X	X		ND
Packet Neighbor test (#767)	X	X		ND
Circuit Path test (#755)	X	X		ND
Destructive Facility test (#757)		X		D
Off-board Destructive Facility test (#756)		X		D
Switch Node Interface Reset test (#761)			X	D

1 D = Destructive, ND = Nondestructive

For descriptions of these tests, see “SNI-BD (SNI Circuit Pack)”.

SRP-EPN

S8700 MC only

MO's Name in Alarm Log	Alarm Level	Full Name of MO
SRP-EPN	MAJOR	SRP-EPN

The Survivable Remote Expansion Port Network (SREPN) provides PN service to the customer when the link to the main processor fails or is broken, or when the processor or center stage fails. SREPN is a disaster recovery operation rather than an additional reliability option.

Due to the hardware solution for SRP (Survivable Remote Processor), maintenance tests to make sure the SRP can go into "survive" mode are not possible.

When the `Survivable Remote Processor` field on the **system-parameters customer-options** screen is `y`, the following alarming strategy is used:

1. When the SRP is not in control of the SREPN (which is the normal state), then every alarm associated with the SREPN is downgraded to a WARNING alarm. These include the EXP-INTF in the SRP, the EXP-LINK between the SRP and the SREPN, and every maintenance component in the SREPN.
2. When the SRP is in control of the SREPN (the EXP-LINK is up between the SRP and SREPN), the disaster recovery state is in effect. A MAJOR alarm is raised against the SRP-EPN MO. Every other MO uses its normal alarm strategy.

If the S8700 Multi-Connect's server loses control (connectivity) to a SREPN, and the SRP associated with the SREPN does not raise a MAJOR alarm against the SRP-EPN MO, then the disaster recovery mechanism is not working.

There are no tests associated with the SRP-EPN MO. The only way to resolve the SRP-EPN alarm is to fix the connectivity problem(s) between the server and the SREPN.

STRAT-3 (Stratum-3 Clock)

S8700 MC only

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
STRAT-3	MAJOR	**test synchronization**	Stratum-3 clock
STRAT-3	MINOR	**test synchronization**	Stratum-3 Clock

The *Digital Synchronization Network Plan (PUB 60110)* specifies a hierarchy of synchronization nodes consisting of Strata 1 to 4, where the public network's sole Stratum-1 clock is the most accurate. The Release 5r system supports both Stratum-3 and -4 operations. See ''Stratum-4 Synchronization'' on page 1754 for details on Stratum-4 operation.

A Stratum-3 clock derives its timing from two DS1 references connected to a Stratum-3 or better source. The Stratum-3 clock provides a holdover of at least 24 hours should both DS1 references fail. (After 24 hours, the Stratum-3 clock still provides service but its accuracy may be degraded). The *Digital Synchronization Network Plan (PUB 60110)* requires that the Stratum-3 clock have duplicated components.

The Stratum-3 clock can be configured with only one DS1 input if one of the Clock Input cards is removed. Also, the Stratum-3 clock can free run (use its internal clock without using DS1 inputs, if both Clock Input cards are removed).

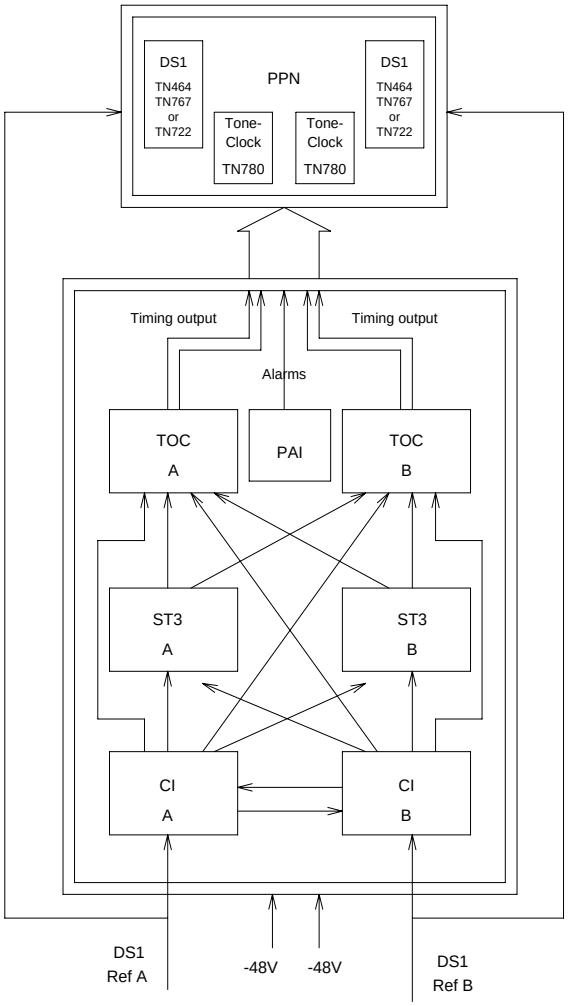
Only a TN780 Tone-Clock circuit pack recognizes and supports a Stratum-3 clock and its alarm signals. (The TN780 Tone-Clock circuit pack is also backward- compatible with a TN768 Tone-Clock circuit pack.) The Stratum-3 clock may be connected to a non-IPSI PN where a TN780 Tone-Clock circuit pack resides. The Stratum-3 clock should never be connected to an IPSI-connected PN.

The only operation that software can perform is a query of the alarm leads. The only recovery action that can be performed on a catastrophic failure of the Stratum-3 clock is using the local oscillator on the active TN780 Tone-Clock circuit pack. Neither software nor the TN780 Tone-Clock circuit pack can request additional information about the health of the Stratum-3 clock other than the information provided by the alarm leads. Furthermore, neither the software nor the TN780 Tone-Clock circuit pack can request that the external clock switch references, change configuration, disable/enable, initialize, and so forth.

In the system, the Stratum-3 clock has been implemented as an external which follows the specification in PUB 60110 for Stratum 3. The only external Stratum-3 clock that is supported is the Telecom Solutions Digital Clock Distributor for Customer Premise Timing (DCD-CPT) Stratum-3 clock. Figure 126, Stratum-3 Clock Hardware Configuration, on page 1731 shows how the Stratum-3 hardware configuration provides clock and alarm signals to the TN780 Tone-Clock circuit pack(s). The reference DS1 facilities connect directly to the Stratum-3 clock for timing purposes, but the DS1 data may be routed into the switch by using a Y connector (H-600-274 G1 for the 50-pin DS1 end or H-600-274 G2 for the 15-pin DS1 end).

For more information about installing a Stratum-3 clock, refer to *Installing the Avaya™ S8700 Media Server with the Avaya™ G600 Media Gateway, the Avaya™ MCC1 Media Gateway, or the Avaya™ SCC1 Media Gateway (Library CD)*.

Figure 126: Stratum-3 Clock Hardware Configuration



Stratum-3 Clock LED Strategy

NOTE:
When looking in the Stratum-3 cabinet, “A” card is on the left and “B” card is on the right.

NOTE:
The normal LED scheme is not followed for this device. Green LEDs do not indicate maintenance activity. There are no yellow LEDs, and there are more than three LEDs per circuit pack.

NOTE:
Removal of a card in the Stratum-3 clock may cause alarm(s) to be resolved and the query test to pass. However, the removed cards should still be replaced to restore the Stratum-3 clock to full service.

The Stratum-3 clock has the following components:

- 2 Clock Input cards (CI)

  Provides the logic to select the better DS1 reference or Clock Input card. The red FAIL LED on this card indicates a failure with the card or the DS1 reference connected to it.

- 2 Stratum-3 Cards (ST3)

  Provides 24-hour holdover. The red FAIL LED on this card indicates a failure with the card. Replace the card.

- 2 Timing Output Cards (TOC)

  Provides cable length compensation, multiple output ports, selection of the ST3, and CI outputs. This type of card has two red failure LEDs: one indicates a failure of the card; the other indicates a failure in one or more output ports. In either case, replace the card.

- 1 PBX (Private Branch Exchange) Alarm Interface (PAI)

  Filters power supplied to the clock, provides fuse protection, and provides alarm indications based on inputs supplied by other cards. The six LEDs on this card provide indications for the six alarm or status conditions as follows:

  — Loss of DS1 reference A

  — Loss of DS1 reference B

  — Loss of one clock unit

  — Loss of both clock units

  — Loss of one power supply

  — Loss of both power supplies

The output of the CI and PAI cards go directly to the TN780 Tone-Clock circuit pack via two 25-pair amphenol-terminated cables. Every card has red and/or green LEDs for providing status or alarm indications. The abbreviations used in the table are defined above except for SRC (source) and PLL (Phase Locked Loop).

Table 753: Stratum-3 Clock LED Indications

Card	Name	Color	Indication
PAI	REF A	Red	Loss of input reference A or CI A failed
	REF B	Red	Loss of input reference B or CI A failed
	ST A	Red	Failed Stratum-3 clock A
	ST B	Red	Failed Stratum-3 clock B
	PWR A	Green	-48VDC A present
	PWR B	Green	-48VDC B present
CI	FAIL	Red	Card failure
	DS1	Green	DS1 source present
	CC	Green	Composite clock source[1] present
	SRC ACTIVE	Green	Card is currently on-line

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Table 753: Stratum-3 Clock LED Indications

ST3	FAIL	Red	Card failure
	LOCK	Red	PLL lost sync with reference or holdover mode
	REF A	Red	Timing Reference from CI A
	REF B	Red	Timing Reference from CI B
TOC	FAIL	Red	Card failure
	PORT ALM	Red	Output port alarm (one or more)
	ST	Green	Reference present from ST clock
	INPUT	Green	Reference present from CI
	500’	Green	500-foot phase advance
	1000’	Green	1000-foot phase advance

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1 Composite Clock (CC) source refers to the protocol used to electrically transfer timing from the Stratum-3 clock to the switch. The Composite Clock source is not relevant to the system.

Error Log Entries and Test to Clear Values

Table 754: Stratum-3 Clock Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test synchronization r 4**
1(a)	Any	Stratum-3 Clock Alarm Query (#649	MINOR	OFF	**test synchronization r 4**
18(b)	0	disable sync	WARNING	OFF	**enable sync**
257(c)	Any	Stratum-3 Clock Alarm Query (#649)	MINOR	OFF	**test synchronization r 4**
513(d)	Any	Stratum-3 Clock Alarm Query (#649	MINOR	ON	**test synchronization r 4**
769(e)	Any	Stratum-3 Clock Alarm Query (#649)	MINOR	ON	**test synchronization r 4**
1025(f)	Any	Stratum-3 Clock Alarm Query (#649)	MINOR MAJOR(h)	ON	**test synchronization r 4**
1281(g)	Any	Stratum-3 Clock Alarm Query (#649)	MINOR /MAJOR(h)	ON	**test synchronization r 4**
1537(i)		none	MINOR MAJOR(h)	ON	
1793(j)		none	MINOR MAJOR(h)	ON	

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Notes:

a This error type corresponds to FAIL code 1 of the Stratum-3 Clock Alarm Query test (#649): either reference A failed or the CI card A failed.

b This error indicates that Synchronization Maintenance was disabled via **disable synchronization-switch**. Execute **enable synchronization-switch** to enable Synchronization Maintenance reference switching and to resolve this alarm.

c This error type corresponds to FAIL code 2 of the Stratum-3 Clock Alarm Query test (#649): one power supply failed.

d This error type corresponds to FAIL code 4 of the Stratum-3 Clock Alarm Query test (#649): one clock unit failed.

e This error type corresponds to FAIL code 8 of the Stratum-3 Clock Alarm Query test (#649): either reference B failed or the CI card B failed.

f This error type corresponds to FAIL code 16 of the Stratum-3 Clock Alarm Query test (#649): every power supplied failed.

g This error type corresponds to FAIL code 32 of the Stratum-3 Clock Alarm Query test (#649): every clock unit failed.

h *An OFF-BOARD alarm on the Stratum-3 clock, indicates a DS1 facility problem; an ON-BOARD alarm indicates a fault in either the Stratum-3 clock or the connection between the Stratum-3 clock and the switch. If the Stratum-3 clock cannot be referenced and the local oscillator on the TN780 Tone-Clock circuit pack must serve as the reference, a Major alarm is raised. Otherwise, a Minor alarm is raised.

i This error can be caused by one of the following conditions:

- One or both TOCs (Timing Output Cards) has failed.
- The connection between the Stratum-3 clock and the TN780 Tone-Clock circuit pack is faulty.
- The TN780 Tone-Clock circuit pack is defective.

A Minor alarm results if the Stratum-3 clock can still provide timing to the switch; otherwise, a Major alarm will be raised because the Stratum-3 clock is not providing timing and the switch is referencing the local oscillator on the TN780 Tone-Clock circuit pack. If only the active TN780 Tone-Clock circuit pack is faulty, the standby TN780 Tone-Clock circuit pack becomes active and remains synchronized to the Stratum-3 clock. When the system switches to the standby Tone-Clock circuit pack, the alarm is resolved, and a TDM-CLK alarm is raised to indicate a possible problem on the TN780 Tone-Clock circuit pack.

If the alarm is minor:

Look for a red LED on either or both TOC cards. If there is a red LED, replace the card. If there is no red LED, use the *Stratum-3 Wiring Guide*, and check that the wiring installation is correct. After replacing the card or correctly rewiring the installation, clear the alarm by issuing **disable synchronization-switch**, followed by **enable synchronization-switch**. The latter procedure causes synchronization software to switch back to using the Stratum-3 clock again. Wait 2 minutes and run **status synchronization**. If Maintenance Name on the status screen shows “STRAT-3,” the problem is resolved.

CAUTION:

The **disable synchronization-switch** command followed by **enable synchronization-switch** may cause slip alarms. The circuit packs that can experience slips and the associated error log entry for slips are as follows.

Table 755: Timing Slip Error Types

Circuit Pack Name	Error Log Name	Error Log Entry for Slips
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 to 3160

If the alarm is major:

Check connections between the Stratum-3 clock and the switch. If there are no loose connections, use the *Stratum-3 Wiring Guide* and check that the wiring installation is correct. After reconnecting the loose connection or correctly rewiring it, clear the alarm by

issuing **disable synchronization-switch**, followed by **enable synchronization-switch**. Wait 1-minute, then run status **synchronization**. If Maintenance Name on the status screen shows “STRAT-3,” then the problem is resolved.

If the Standby Tone-Clock circuit pack became active:

Check the connection between the Stratum-3 clock and the TN780 Tone-Clock circuit pack from which the system has just switched. If there are no loose connections, then, replace the circuit pack containing the TN780 Tone-Clock circuit pack. Before switching back to the new TN780 Tone-Clock circuit pack, use **test tone-clock *UC* long** to check that the Tone-Clock is receiving a signal from the Stratum-3 clock. If every test passes, switch to the new Tone-Clock circuit pack via **set tone-clock *UC* override**. If Test #651 fails, then the original TN780 Tone-Clock circuit pack should be reinserted, and the cable between the Stratum-3 clock and the TN780 Tone-Clock circuit pack should be replaced. If Test #651 continues to fail, then escalate the problem.

If slip alarms exist after following the repair procedures for any of the previous cases, clear the slip alarms by running **test board clear**. See Table 755, Timing Slip Error Types, on page 1735 for a list of circuit packs and associated slip error log entries.

This error indicates that the Tone-Clock circuit pack in the master port network is not a TN780. If duplicate Tone-Clock circuit packs exist in the master port network, this error may mean that one or both Tone-Clock circuit packs are not TN780s. Verify that the Tone-Clock(s) in the master port network are TN780s.

System Technician-Demanded Tests: Descriptions and Error Codes

The **test synchronization** command also runs the Test Synchronization test (#417). Test 417 is described in SW-CTL (Switch Control) on page 1742.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Stratum-3 Clock Alarm Query (#649)	X	X	ND

1 D = Destructive, ND = Nondestructive

Stratum-3 Clock Alarm Query (#649)

This test queries the Stratum-3 clock for its alarm status and reports the results of the query. The Stratum-3 clock provides the system with the following six alarm indications via the TN780 Tone-Clock circuit pack:

- Reference A failed or CI card A failed.
- Reference B failed or CI card B failed.
- One power supply failed.
- Every power supply failed.
- One clock unit failed.
- Every clock unit failed.

CAUTION:

The removal of a card in the Stratum-3 clock may cause alarm(s) to be resolved and the query test to pass. However, the removed cards should still be replaced to restore the Stratum-3 clock to full service.

Table 756: TEST #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	The system could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to up to 3 times.
1005	ABORT	This test aborts when it is run on a Stratum-4 system. Do not change synchronization to Stratum 3 without consulting the synchronization plan administrator for this switch.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
1	FAIL	Either Reference A failed or CI card A failed. This condition usually indicates a failure of the DS1 reference; however, there may also be a failure of the CI card to which the reference is connected. The system technician dispatched to investigate this problem should take a spare CI card in case the CI card caused the failure. If you are NOT ON-SITE, use the following procedure: **1** Use **display error** to look for DS1-BD (DS1 Interface Circuit Pack) errors. See the DS1-BD Maintenance documentation for recommended strategy to resolve any DS1-BD errors found. **2** If there are no DS1-BD errors **or** after resolving every DS1-BD error, use **test synchronization r 4** to see if the alarm still exists. If every test repetition passes, then the alarm no longer exists. Otherwise, the system technician should be dispatched with a spare CI card to use the following instructions on-site. (*continued*)

1 of 4

Table 756: TEST #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
1	FAIL	(*continued*) If you are ON-SITE, use the following procedure: **1** Look for a red LED on CI card A (i.e., the left CI card). If there is a red LED, then replace the CI card, if a spare is available. If no spare CI is available on-site, proceed to Step 3. If after replacing the CI card, the red LED on the new CI card lights also, then proceed to Step 3. **2** If a spare CI card is available, replace the suspect CI card. Otherwise, use **test synchronization r 4** to clear the alarm. If any test repetitions fail, then follow the procedure for those failures. **3** Use **display error** to look for DS1-BD (DS1 Interface Circuit Pack) errors. See the DS1-BD Maintenance documentation for recommended strategy to resolve any DS1-BD errors found. If there are no DS1-BD errors, then proceed to Step 5. **4** After every DS1-BD error has been resolved, use **test synchronization r 4** to clear the alarm and see if the alarm still exists. If any test repetitions fail, follow the procedures for those failures. **5** Check the DS1 reference A connections to the Stratum-3 clock. **6** To determine whether the alarm still exists, issue the **test synchronization r 4** command to clear the alarm. If any test repetitions fail, then follow the procedures for those failures.
2	FAIL	One power supply failed. This error occurs when the Stratum-3 clock has two power supplies, and one of them has failed. However, the clock can function with one power supply. **1** Locate the failed power supply (the one with a red LED), and replace it. The power supplies reside under the Stratum-3 clock's carrier. **2** To determine whether the alarm still exists, use **test synchronization r 4** to clear the alarm. If any test repetitions fail, then follow the procedures for those failures.
4	FAIL	One clock unit failed. **1** Look at the Stratum-3 cabinet for a red LED on a circuit card marked "ST3." Replace the card. **2** To determine whether the alarm still exists, use **test synchronization r 4** to clear the alarm. If any test repetitions fail, then follow the procedures for those failures.

Table 756: TEST #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
8	FAIL	Reference B failed or CI card B failed. This condition usually indicates a failure of the DS1 reference; however, there may also be a failure of the CI card to which the reference is connected. The system technician dispatched to investigate this problem should take a spare CI card in case the CI card caused the failure. If you are NOT ON-SITE, use the following procedure: **1** If there were no DS1-BD errors **or** if every DS1-BD error has been resolved, enter **test synchronization r 4** to determine whether the alarm is still present. If every repetition of the test passes, the alarm no longer exists. Otherwise, the system technician should be dispatched with a spare CI card to perform the following instructions on-site.
8	FAIL *(cont'd)*	If you are ON-SITE, use the following procedure: **1** Look for a red LED on a CI card B (the CI card on the right). If there is a red LED, then replace the CI card, if a spare is available. If no spare CI is available on-site, proceed to Step 3. If, after replacing the CI card, the red LED on the new CI card lights, proceed to step 3. **2** Otherwise, enter **test synchronization r 4** to clear the alarm. If any test repetitions fail, follow the procedure for those failures. **3** Enter **display errors** and look for DS1-BD errors. If there are any, see DS1-BD (DS1 Interface Circuit Pack) on page 760. If there are no DS1-BD errors, proceed to step 5. **4** After every DS1-BD error has been resolved, determine whether the alarm still exists with **test synchronization r 4**. If any test repetitions fail, follow procedures for those failures. **5** Check the DS1 reference A connections to the Stratum-3 clock. **6** Determine whether the alarm still exists with **test synchronization r 4** to clear the alarm. If any test repetitions fail, then follow procedures for those failures.
16	FAIL	Every power supply failed. **1** Replace the failed power supplies. **2** If battery backup for the Stratum-3 clock is not supplied or if the battery backup holdover time has been exceeded, then the system will be referencing the local oscillator on the active TN780 Tone-Clock circuit pack until software detects that one or both power supplies have been restored (approximately 40 minutes). To speed up this restoration, use **test synchronization r 4**. Every test should pass. If any repetitions should fail, then follow the procedures for those failures. The battery backup resides under the Stratum-3 clock's carrier.

Table 756: TEST #161 Loop-Around Test

Error Code	Test Result	Description / Recommendation
32	FAIL	Every clock unit failed. **1** Look at the Stratum-3 cabinet for red LEDs on circuit cards marked "ST3." Replace the card(s). **2** To determine whether the alarm still exists, issue **test synchronization r 4** to clear the alarm. If any test repetitions fail, then follow the procedures for those failures.
2101	FAIL	The TN780 Tone-Clock circuit pack detects loss of signal. See note h of the STRAT-3 Hardware Error Log Entries table in the STRAT-3 (Stratum-3 Clock) Maintenance documentation for replacement procedures.
	PASS	The Stratum-3 clock has reported that it has no alarm conditions. If synchronization problems have been reported, look for SYNC errors and see ''SW-CTL (Switch Control)'' for recommended strategy for those errors.

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SVC-SLOT (Service Slot)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
SVC-SLOT	MINOR	none	Service Slot

The Service Slot MO detects the insertion of an invalid circuit pack into a dedicated SERVICE slot. The SERVICE slot is the left-most slot in the J58890BB port carrier, and is identified as slot location "00" in commands and screen fields.

Because this slot does not provide tip and ring connectivity to the wall field, only the following circuit packs are allowed:

- TN744 Call Classifier
- TN750 Integrated Announcement
- TN771 Maintenance/Test
- TN725 Speech Synthesizer
- TN433 Speech Synthesizer
- TN457 Speech Synthesizer
- TN748 Tone Detector
- TN420 Tone Detector

When another circuit pack is inserted in a SERVICE slot, a MINOR alarm is generated against the Service Slot MO. Instead of the illegal circuit pack's MO name, the "Service Slot" MO name is used to prevent any attempt to assign a port to the illegal pack physically residing in the SERVICE slot.

Error Log Entries and Test to Clear Values

Table 757: Service Slot Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
600 (a)		None	MINOR	ON	

Note:

a Indicates that an invalid circuit pack was inserted in slot 00, the SERVICE slot, of a J58890BB port carrier. See the previous list of valid circuit packs.

To see the invalid circuit pack's TN code, use **list configuration board *UUCSS*** where UU is the cabinet number, C is the carrier letter, and SS is the slot number (always 00) of the alarmed circuit pack.

To retire the alarm, remove the invalid circuit pack.

SW-CTL (Switch Control)

S8100 only

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
SW-CTL	MAJOR	**test switch-control [1a] sh**	Switch Control
SW-CTL	WARNING	**test switch-control**	Switch Control

The Switch Control (SW-CTL) Maintenance Object resides on the TN2314 Processor board. It is used to send control information between port circuit packs and the system processor. This control information is sent via the Time Division Multiplex (TDM) Bus. The portion of the TDM Bus used to transmit control messages is called the control channel. The control channel can be on either TDM Bus A or TDM Bus B, but only one bus is used for the control channel at any given time.

The Switch Control is critical in the setup and take down of all calls but is not involved in the voice or data transmission that takes place during established calls. The Switch Control also detects which circuit packs are present in the system. This information is sent to the processor at system initialization time and when a circuit pack is plugged into the system or removed from the system.

The Switch Control also monitors the health of the control channel on the TDM Bus and informs the TDM-BUS Maintenance Object when errors occur. It also monitors critical system timing signals generated by the Tone Clock circuit on the TN2314 circuit pack and informs the TDM-CLK Maintenance Object when a failure is detected.

Error Log Entries and Test to Clear Values

Table 758: SW-CTL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test switch-control
1(a)	Any	Control Channel Test (#94)	MAJOR	ON	test switch-control r 3
2 (b)		Control Channel Test (#94)	MAJOR	ON	test switch-control r 3
769 (c)	Any	None			
1025		Switch Control Loop Around Test (#92)	MAJOR	ON	test switch-control r 2
1281 (d)	Any	None			
1537 (e)		Switch Control Reset Action(#93)	MAJOR	ON	reset switch-control

Table 758: SW-CTL Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
2049 (f)		Control Channel Transmission Test(#94)	WARNING	???	test switch-control
3841 (g)		Switch Control Restart Action(#1357)	MAJOR	ON	reset switch-control restart

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1 Indicates that an alarm was raised but that the associated error could not be entered into the hardware error log due to a momentary overload condition. Run the short test and refer to the appropriate test description for tests that fail.

Notes:

a Error Type:1 - This error indicates that more than 8 circuit packs have been removed in the last 15 minutes. Generation of this error may indicate that there is a problem with the TN2314 Processor circuit pack or with the TDM bus. The alarm caused by this condition can be resolved by 3 successful completions of the Control Channel test (#94).

b Error Type: 2 - The Switch Control Channel Transmission test failed. This error may not cause a Switch Control alarm if Error Type 769 is also present since this error may actually be caused by the loss of clock signals and not by a Switch Control failure.

c Error Type: 769 - This error occurs when the Switch Control reports a loss of timing signals to the processor. When this error is present, the Switch Control is usually not alarmed since any Switch Control test failures are actually the result of faulty signals from the Processor/Tone-Clock. See TDM-CLK (TDM Bus Clock) Maintenance documentation for the procedures needed to diagnose Tone-Clock circuit pack troubles.

d Error Type: 1281 - This error indicates a loss of handshake between the SW-CTL firmware and the system software. Look for and resolve all other SW-CTL errors. Normally this error causes Switch Control maintenance tests to run which will cause other errors to be generated. In the rare case where no other errors are logged, but Error Type 1281 is occurring at a high rate (more than 20 in the previous hour), escalate the problem.

A loss of handshake is caused by a failure of the hardware or firmware on the Processor circuit pack. Follow these repair steps:

1 Look for and resolve all other SW-CTL errors.

2 Look for and resolve all other PKT-CTRL errors.

3 Restart the Switch Control firmware on the Processor board by entering the *reset switch-control restart* command. If this test passes, the switch control firmware is operational. If the test fails, refer to the repair procedure for the Restart Test (#1357)

e Error Type: 1537 - This error indicates that the Switch Control Reset Action failed. This failure may be caused by a failure of the hardware or firmware on the Processor circuit pack. Refer to the repair procedures in "Switch Control Reset Action(#93)" on page 1746.

f Error Type: 2049 - This error indicates that the Control Channel Transmission Test failed. This failure occurs when no port boards are present in the system. Run the **test switch-control clear** command with one or more port board present to clear the alarm.

g Error Type: 3841- This error indicates that the Switch Control Restart Action failed. This failure may be caused by a failure of the hardware or firmware on the Processor circuit pack. If this error counter reaches a count of 2, Communication Manager is restarted in an attempt to correct the problem by downloading the Switch Control firmware to the MPC860 processor on the TN2314 board. Refer to the repair procedures for the Restart Test (#1357)

Recommended Repair Kits: Processor circuit pack (TN2314) with correct software release.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below when inspecting errors in the system. By clearing error codes associated with the *Switch Control Restart Test*, for example, you may also clear errors generated from other tests in the testing sequence.

Table 759: SW-CTL System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Sequence	Restart Sequence	D/DR/ ND[1]
Control Channel Interface Test (#92)	X	X			ND
Control Channel Transmission Test (#94)	X	X			ND
Switch Control Reset Action(#93)			X		DR
Switch Control Restart Action (#1357)				X	DR

1 D = Destructive; DR = Disruptive, ND = Nondestructive

Control Channel Interface Test (#92)

Loop back messages are sent to the Switch Control via the interface used for control channel messages. The messages are returned to the SPE for verification via the same interface.

Table 760: TEST #92 Control Channel Interface Test

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal system error
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.

Table 760: TEST #92 Control Channel Interface Test *Continued*

Error Code	Test Result	Description/ Recommendation
other	FAIL	Messages could not be looped back through the control channel interface. The customer probably cannot make or receive calls. **1** This failure could be due to either a Processor circuit pack failure or the loss of system timing signals. If the Switch Control is alarmed, then suspect a Processor circuit pack failure. If the Switch Control is not alarmed, investigate the possible loss of system timing signals before replacing the Processor circuit pack. Test #94 also fails if the system timing signals are lost. If Test #94 passes, do not suspect the loss of timing signals. **2** Run the Short Test Sequence several times to make sure that this failure is occurring consistently. Run the Restart Test Sequence (*reset switch-control restart*) to reset the Switch Control. Sometimes restarting the Switch Control firmware may clear the problem. If the test is still failing, proceed to the next step. **3** Shut down the processor and reboot it to cause the Switch Control firmware to be downloaded from the Pentium processor to the MPC860 processor on the TN2314 circuit pack. If this does not correct the problem, go to Step 4 or Step 5. **4** If the system can process calls but still fails the test, replace the Processor board at a time that will cause the least disruption to the customer. **5** If calls cannot be made, replace the Processor board immediately. **CAUTION:** Reseating/Replacing the TN2314 Processor/Tone -Clock circuit pack will disrupt service. Please perform the procedure with caution. Refer to Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)* and Tone-Clock Replacement on page 1546 for information on replacing the TN2314 Processor/Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack.
	PASS	The control channel interface between the processor and the Switch Control is working correctly.

Switch Control Reset Action(#93)

This test is disruptive.

This test resets the Switch Control and determines if it can successfully go through its initialization sequence. The test is disruptive since there is the possibility of losing some control messages to or from port circuit packs. Existing calls are not disconnected.

Table 761: TEST #93 Switch Control Reset Action

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal system error
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.
2000 or None	FAIL	The Switch Control could not be successfully reset. If this is a standard system, the customer probably cannot make or receive calls. **1** This failure could be due to either a Processor circuit pack failure or the loss of system timing signals. If the Switch Control is alarmed, then suspect a Processor circuit pack failure. If the Switch Control is not alarmed, investigate the possible loss of system timing signals. See “TDM Bus Clock”. If many port circuit pack LEDs are lit, suspect a TDM Bus Clock problem. If only the Processor circuit pack LED is lit, suspect the Processor circuit pack. If the Processor circuit pack is determined to be at fault, proceed to Step 2. **2** Restart the Switch Control firmware by running the Switch Control Restart action (See Test 1357). Follow the repair procedures for that test.
	PASS	The Switch Control has initialized correctly. Look at results of the other tests to see if the Switch Control is operating correctly.

Control Channel Transmission Test (#94)

Control channel messages are sent from the SPE to selected port circuit packs and the response from the port circuit packs is checked. This tests the ability of the Switch Control to send and receive messages on the control channel of the TDM Bus.

Table 762: TEST #94 Control Channel Transmission Test

Error Code	Test Result	Description/ Recommendation
0	ABORT	The port circuit packs necessary for this test are not available. **1** For Release 1 of S8100, verify that a TN744 Call Classifier circuit pack is plugged into the system. For later releases, verify that at least one port circuit pack is plugged into the system. **2** Retry the command at 1-minute intervals a maximum of 5 times. **3** If the test continues to abort, run the Restart Action (*reset switch-control restart*) to see if the problem clears. **4** If the test continues to abort, restart the system to see if the problem clears. **5** Then replace the Processor circuit pack. **CAUTION:** Reseating/Replacing the TN2314 Processor/Tone -Clock circuit pack will disrupt service. Please perform the procedure with caution. Refer to section on replacing the TN2314 Processor/Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack.
2012	ABORT	Internal system error
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.

Table 762: TEST #94 Control Channel Transmission Test

Error Code	Test Result	Description/ Recommendation
0	FAIL	The Switch Control cannot communicate on the TDM Bus control channel. The customer probably cannot make or receive calls. **1** Run the Short Test Sequence several times to make sure this failure is occurring consistently **2** If there are no TDM Bus alarms against the Standby TDM Bus, switch the control channel from its current bus to the Standby bus. If this test passes on the new bus, investigate the possibility of TDM Bus failures. If the test fails even after the control channel is switched to the standby TDM Bus, proceed to Step 3. **3** Restart the Switch Control firmware by running the Restart Test (#1357) (*reset switch-control restart*) **4** If the test continues to fail, shut down the processor and reboot it. This will cause the Switch Control firmware to be downloaded from the Pentium processor on the TN2314 to the MPC860 processor on the TN2314. If the test continues to fail, go to Step 5. **5** If calls still cannot be made, replace the Processor board.
1	FAIL	The port circuit packs necessary for this test are not available. **1** Verify that at least one port circuit pack is plugged into the system. **2** Retry the command at 1-minute intervals a maximum of 5 times.
2	FAIL	The Switch Control cannot talk to the Tone Generator on the Processor circuit pack. **1** Display the hardware error and alarm log for TDM-BUS. If there are no TDM Bus alarms against the Standby TDM Bus, switch the control channel from its current bus to the Standby bus. If this test passes on the new bus, investigate the possibility of TDM Bus failures. If the test fails even after the control channel is switched to the Standby TDM Bus, proceed to step 2. **2** Restart the Switch Control firmware by running the Restart Test (#1357) (**reset switch-control restart**). **3** If the test continues to fail, shut down the processor and reboot it. This will cause the Switch Control firmware to be downloaded from the Pentium processor on the TN2314 to the MPC860 processor on the TN2314. **4** If the test continues to fail replace the Processor circuit pack.

Table 762: TEST #94 Control Channel Transmission Test

Error Code	Test Result	Description/ Recommendation
3	FAIL	The Switch Control cannot talk to the port boards using the TDM Bus. **1** Display the hardware error and alarm log for TDM-BUS. If there are no TDM Bus alarms against the Standby TDM Bus, switch the control channel from its current bus to the Standby bus. If this test passes on the new bus, investigate the possibility of TDM Bus failures. If the test fails even after the control channel is switched to the Standby TDM Bus, proceed to step 2. **2** Restart the Switch Control firmware by running the Restart Test (#1357) (**reset switch-control restart**). **3** If the test continues to fail, shut down the processor and reboot it. This will cause the Switch Control firmware to be downloaded from the Pentium processor on the TN2314 to the MPC860 processor on the TN2314. **4** If the test continues to fail replace the Processor circuit pack.
	PASS	The Switch Control can communicate with the port circuit packs over the TDM Bus.

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Switch Control Restart Action(#1357)

This test is disruptive.

This test restarts the Switch Control firmware and determines if it can successfully go through its initialization sequence. The test is disruptive since there is the possibility of losing some control messages to or from port circuit packs. Existing calls are not disconnected.

Table 763: TEST #1357 Switch Control Restart Test

Error Code	Test Result	Description/ Recommendation
2012	ABORT	Internal system error
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.

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Table 763: TEST #1357 Switch Control Restart Test

Error Code	Test Result	Description/ Recommendation
2000 or None	FAIL	The Switch Control could not be successfully restarted. The customer probably cannot make or receive calls. **1** This failure is probably due to either a problem with the firmware that provides the Switch Control function on the Processor circuit pack or a failure of the hardware on the Processor circuit pack. If the Switch Control is alarmed, then proceed to Step 2. **2** If calls cannot be made, shut down the processor and restart it to see if a download of the firmware from the Pentium processor on the TN2314 to the MPC860 processor on the TN2314 corrects the problem. **3** If calls cannot be made after the system reboots, replace the Processor circuit pack. **CAUTION:** Reseating/Replacing the TN2314 Processor/Tone -Clock circuit pack will disrupt service. Please perform the procedure with caution. Refer to section on replacing the TN2314 Processor/Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack. **Note**: If the 3841 error associated with the failure of this Restart test reaches a count of 2, Communication Manager is restarted in an attempt to correct the problem.
	PASS	The Switch Control has restarted successfully. Look at results of the other tests to see if it is operating correctly.

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SYNC (Port-Network Synchronization)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
SYNC	MINOR	**display errors**	Port Network Synchronization
SYNC	WARNING	**test synchronization**	Port Network Synchronization

This section discusses synchronization problems local to the switch. For further information about synchronization including network synchronization, refer to *AT&T Network and Data Connectivity , 555-025-201*.

Synchronization maintenance is composed of both hardware and software components, and its purpose is to provide a common reference frequency for reliable digital communications between an media servers and other PBXs, central offices (COs), or customer-premises equipment (CPE). Synchronization is implemented using several system components including:

- TN2312 IPSI
- TN722, TN767, and TN464 DS1 Interfaces (all suffixes)
- **S8700 MC**: TN768, TN780, or TN2182 Tone-Clock
- **S8700 MC**: TN572 Switch Node Clock
- **S8700 MC**: TN573 Switch Node Interface
- **S8700 MC**: TN570 Expansion Interface

NOTE:
If both a primary and secondary references are administered for Stratum-4 synchronization, both references must reside in the same port network (PN).

S8700 MC

Traditional Sync Operation

For a DEFINITY system or for an S8700 Media Server Multi-Connect system, synchronization is obtained from the public circuit-switched network via:

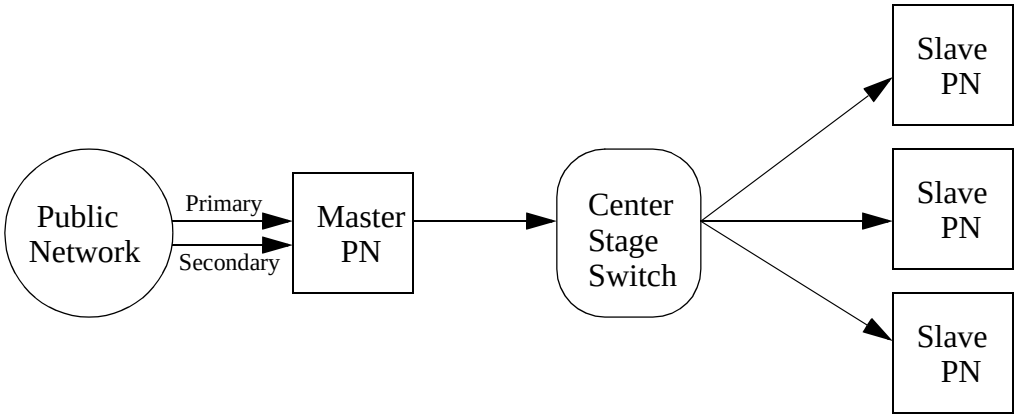
- A DS1 or BRI interface
- The ATM network

For DS1- or BRI-based synchronization, a particular DS1 or PRI interface is configured as the synchronization reference. The IPSI/Tone-Clock board in the same PN locks on to this reference and regenerates clock signals that are placed on the PN's backplane. In turn, the Center Stage Switch (CSS) components transfer this timing to every other PN. These IPSI/Tone-Clocks then regenerate clock signals for their own PNs at the same rate as the:

- Master PN
- Public network

This creates a hierarchy where the master PN receives timing from the public network, and every other PN derives its timing from the master through the CSS. See Figure 127, Traditional Sync Operation, on page 1752.

Figure 127: Traditional Sync Operation



Typically, a pair of interfaces from the public network are configured — one as a primary and one as a secondary. The IPSI/Tone-Clock in the Master PN can:

- Lock onto either interface
- Switch between them in the event of a failure

In the event of a dual failure, the Tone-Clock in the master PN can generate its own timing and keep every PN synchronized. However, these PNs would not be synchronized with any other public-network interfaces that exist in any of the PNs.

When a center stage is implemented via an ATM network, it is possible to obtain timing from the ATM network. For more information, See ATM-SYNC (ATM Synchronization) on page 439.

S8700 IP

IP-Connected S8700 Media Server Sync Operation

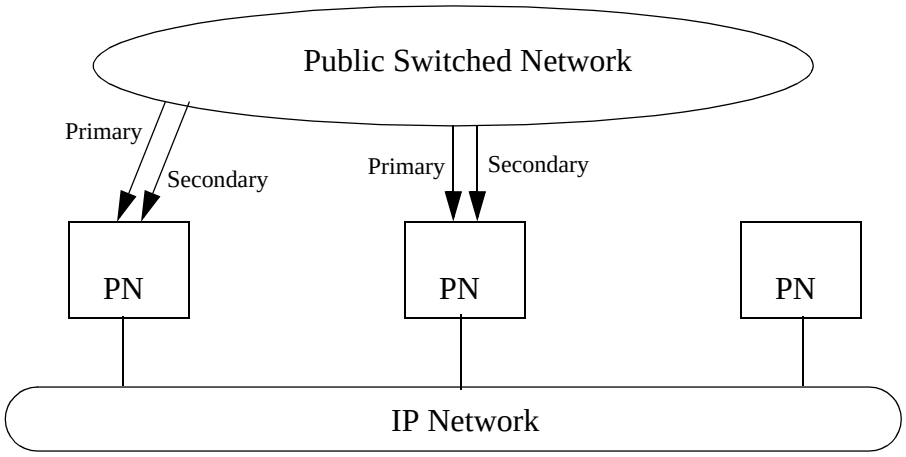
For an S8700 IP Connect system, its port networks (PNs) are connected via the customer's IP network. This network cannot be used to transmit timing information between the PNs. The complete set of PNs need not be synchronized with each other. Inter-PN bearer traffic is carried as VOIP, while the Media Processors' internal jitter buffers deal with differences in transmission rates.

Synchronization is needed for a PN with a public-network digital interface. Each PN with a DS1 or trunk-side BRI interface must be synchronized with an external timing source to prevent slips between that PN and the external circuit-switched network. Each S8700 Media Server IP-connected PN needs to operate like a DEFINITY system. Each S8700 IP Connect PN:

- Potentially needs its own external synchronization reference
- Is always locked to an external public-network interface

or is running locally. A typical S8700 IP Connect configuration is shown in Figure 128, S8700 Media Server IP-Connected Sync Operation, on page 1753.

Figure 128: S8700 Media Server IP-Connected Sync Operation



The previous figure shows the third S8700 IP Connect system's PN without public-network digital interface. A PN without public-network connectivity runs off of its local IPSI circuit pack's Tone-Clock circuit.

Clock Synchronization

NOTE:
S8700 MC: Stratum-3 clocking is not available for a PN where the Tone-Clock function is supplied by either a:

- TN2312 IPSI circuit pack's Tone-Clock circuit
- TN2182 Tone-Clock circuit pack

This section discusses synchronization with Stratum-3 and -4 clocking devices.

S8700 MC

Stratum-3 Synchronization

Since the clock module on the TN2312 does not support synchronization with an external Stratum-3 clocking device, you may provide Stratum-3 clocking for a S8700 Media Server system by using the TN780 Tone-Clock circuit pack in a non-IPSI-connected port network. To bring in the external Stratum-3 clocking signals into the TN780, a processor carrier is needed. This new PN control carrier will replace the processor carrier in the old PPN converted to PN 1. The Stratum-3 clocking must come into Port Network #1 because the S8700 Multi-Connect software has the Stratum-3 clocking hard-coded to this port network.

Stratum-4 Synchronization

The system can be configured with primary and secondary synchronization references (DS1 or UDS1 Interface circuit packs) when using Stratum-4 synchronization. If this is the master synchronization source for the network, then its local oscillator is used and no DS1s are used as references.

If this system is a slave in the network, a primary reference must be used as the synchronization reference and a secondary reference is optional:

- If the primary synchronization reference is not providing a valid timing signal, the system automatically switches to the secondary synchronization reference.
- If the primary synchronization reference is invalid and secondary reference does not provide a valid timing signal or is not administered as a synchronization reference, an IPSI's Tone-Clock circuit or a Tone-Clock circuit pack provides the PN's timing source.
- If the system is using the local oscillator as the timing source (both the primary and secondary references are providing invalid timing signals), should either the primary or secondary reference becomes valid again, the system (PN for S8700 Media Server systems) switches back to the primary or secondary source.
- When both the primary and secondary source become valid, the system switches to the primary source, since the primary source is always preferred over the secondary source when both sources are equally healthy.

S8100: There are two kinds of Stratum 4 synchronization that are supported: Type I and Type II. Stratum 4 type I is more stable than Type II and provides some switching capability at the hardware level. It is important to note that Stratum 4 Type I operation is not possible when one or both of the DS1 interface circuit packs providing the reference sources is a TN722. Both must be the TN767B (or higher) or TN464C (or higher).

Synchronization Troubleshooting

For Stratum-4 operation, major and minor alarms indicate that there is a problem with the system synchronization references. These alarms will be resolved when the alarmed synchronization reference is restored.

The **change synchronization** command allows primary and secondary references to be administered per cabinet.

Use **status synchronization** to show the current synchronization reference per cabinet. Use **display synchronization and list synchronization** to show the synchronization references (e.g. primary, secondary) that are administered.

Use **list timing-source** to see all DS1 and UDS1 locations that are allowed to be administered as primary or secondary references with **change synchronization**.

Other commands associated with Synchronization Maintenance are **disable synchronization-switch** and **enable synchronization-switch.** These commands are used to disable the ability of Synchronization Maintenance to switch between synchronization references and to enable this switching ability, respectively. Use **set synchronization** only after synchronization has been disabled, to manually switch to a specific synchronization reference. Use **set synchronization** to help diagnose synchronization problems by forcing a specific reference (DS1, UDS1, or Tone-Clock) to be the system synchronization reference to determine if a specific reference is providing a valid timing signal.

S8100: For Stratum 3 operation, only a TN780 Tone-Clock circuit pack may be specified. To switch synchronization to the Stratum 3 clock, use the **enable synchronization-switch** command after verifying that the Stratum 3 clock is wired correctly.

Troubleshooting Approach

Slip errors are the primary symptom associated with being unsynchronized.

A correct Synchronization plan for the network keeps the systems within the network transmitting data at approximately the same rate to avoid situations where:

- One system transmits data at a rate faster than another system can receive the data (in which case data is lost).
- One system transmits data at a rate slower than another system expects to receive data (in which case data is repeated).

Either of these situations, data being lost or repeated, is a slip.

When troubleshooting synchronization problems when slips are the primary error log entry indications of a synchronization problem, requires that the problem be isolated to:

- A problem outside of the switch (That is, the switch is not properly synchronized to the rest of the network.)
- A problem internal to the switch

DS1 and UDS1 circuit packs can be administered with slip detection enabled via the **Slip Detection** field set to a **y** (see **add ds1**, **change ds1**, and **display ds1**). All DS1 and UDS1 circuit packs administered as slip enabled are counted in the following algorithm:

When over half of the DS1 and UDS1 circuit packs administered as slip enabled are experiencing slips, and the primary or secondary synchronization reference is the current synchronization reference, synchronization will try the other administered synchronization reference.

In situations where one or many circuit packs in the system are experiencing slips, the problem could be with the synchronization reference, with individual circuit packs, or with phase modulation of the transmitted digital bit streams due to environmental variations of the transmission facilities (such as temperature variations that affect the electrical length of a transmission line). The circuit packs that can experience slips and the associated error log entry for slips are as follows in Table 764:

Table 764: Error Log Entries for Slip Errors

Circuit Pack	Error Log Name	Error Log Entry for Slips
DS1 Interface	DS1-BD	3073 – 3160
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
IPSI's Tone-Clock circuit or Tone-Clock	TDM-CLK	1025
UDS1 Interface	UDS1-BD	3073 – 3160

When slips occur on any of these circuit packs, first consult the individual circuit pack's section in this manual. If slips occur in small amounts, they may be due to environmental conditions as previously described. If no service degradation is occurring, no action is necessary. When the system switches synchronization sources, slips can be expected from DS1-BD, and UDS1-BD, and EXP-INTF circuit packs. If service degradation occurs, after following the repair steps in the individual section, use the following trouble shooting techniques.

Table 765 lists circuit packs that can report slips and related circuit packs whose hardware problems that cause those slips.

Table 765: Slips and Related Circuit Packs

Circuit Pack Reporting Slips	Associated Circuit Packs that Can Cause Slips
DS1 Interface	Active Tone-Clock in same PN
Expansion Interface	Active Tone-Clock in same PN or circuit pack at opposite end of fiber or metallic connection
Switch Node Interface	Circuit pack at opposite end of fiber or metallic connection, or active Switch Node Clock circuit pack in same switch node carrier
IPSI's Tone-Clock or Tone-Clock	Current DS1 reference
UDS1 Interface	Active Tone-Clock in same PN

Troubleshooting Synchronization Problems

The following flow chart presents a logical approach to troubleshooting synchronization problems in conjunction with the previous background information. Explanatory notes follow the charts.

Figure 129: Synchronization Troubleshooting, Fig. 1 of 6

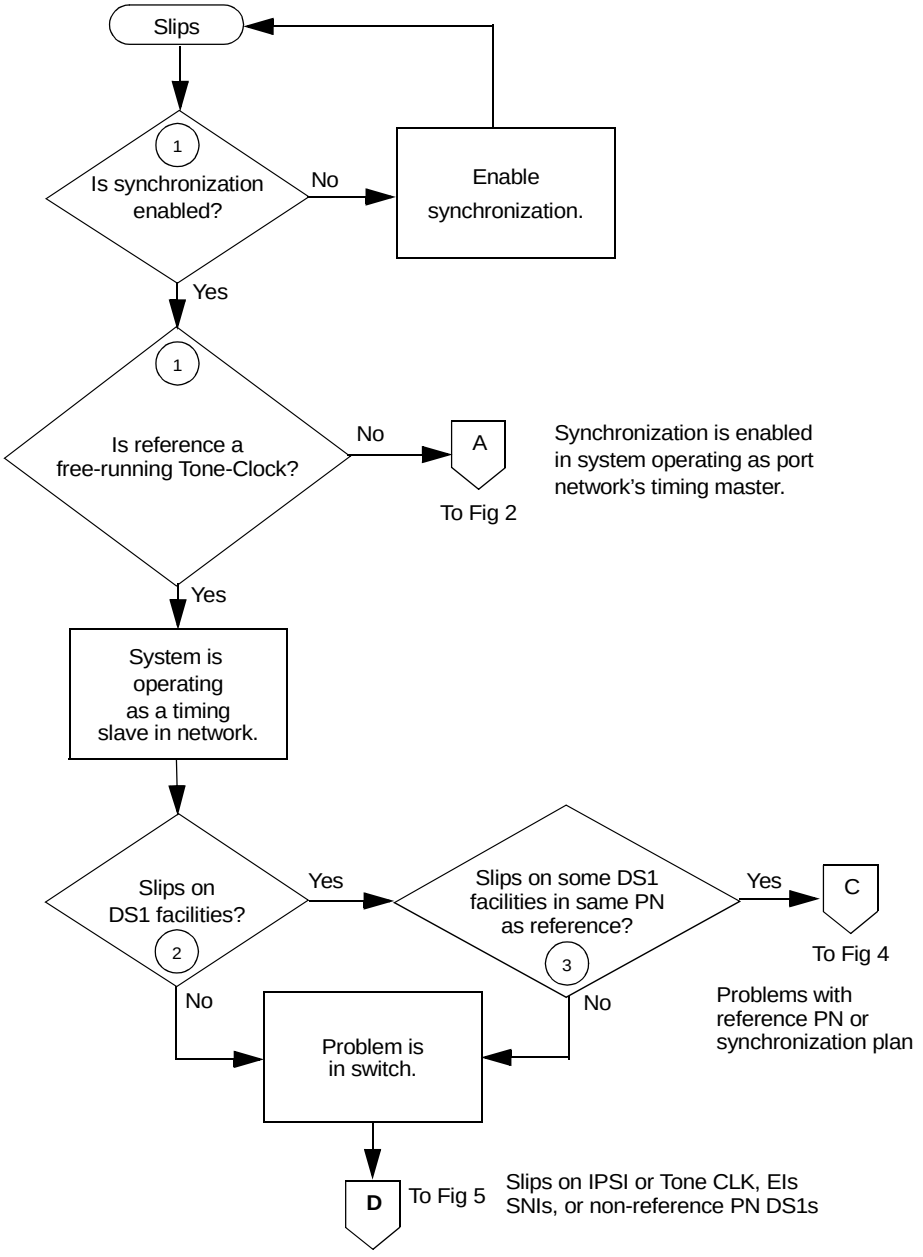


Figure 130: Synchronization Troubleshooting, Fig. 2 of 6

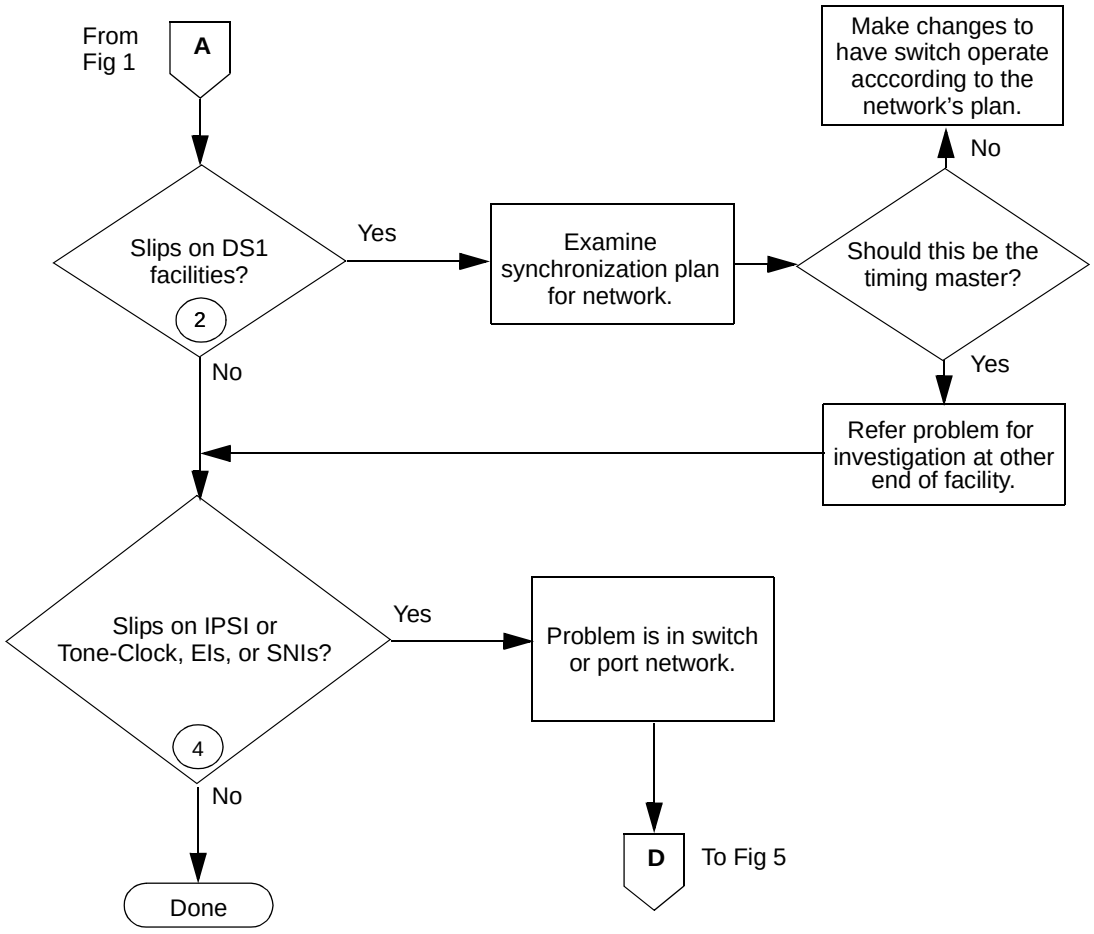


Figure 131: Synchronization Troubleshooting, Fig. 3 of 6

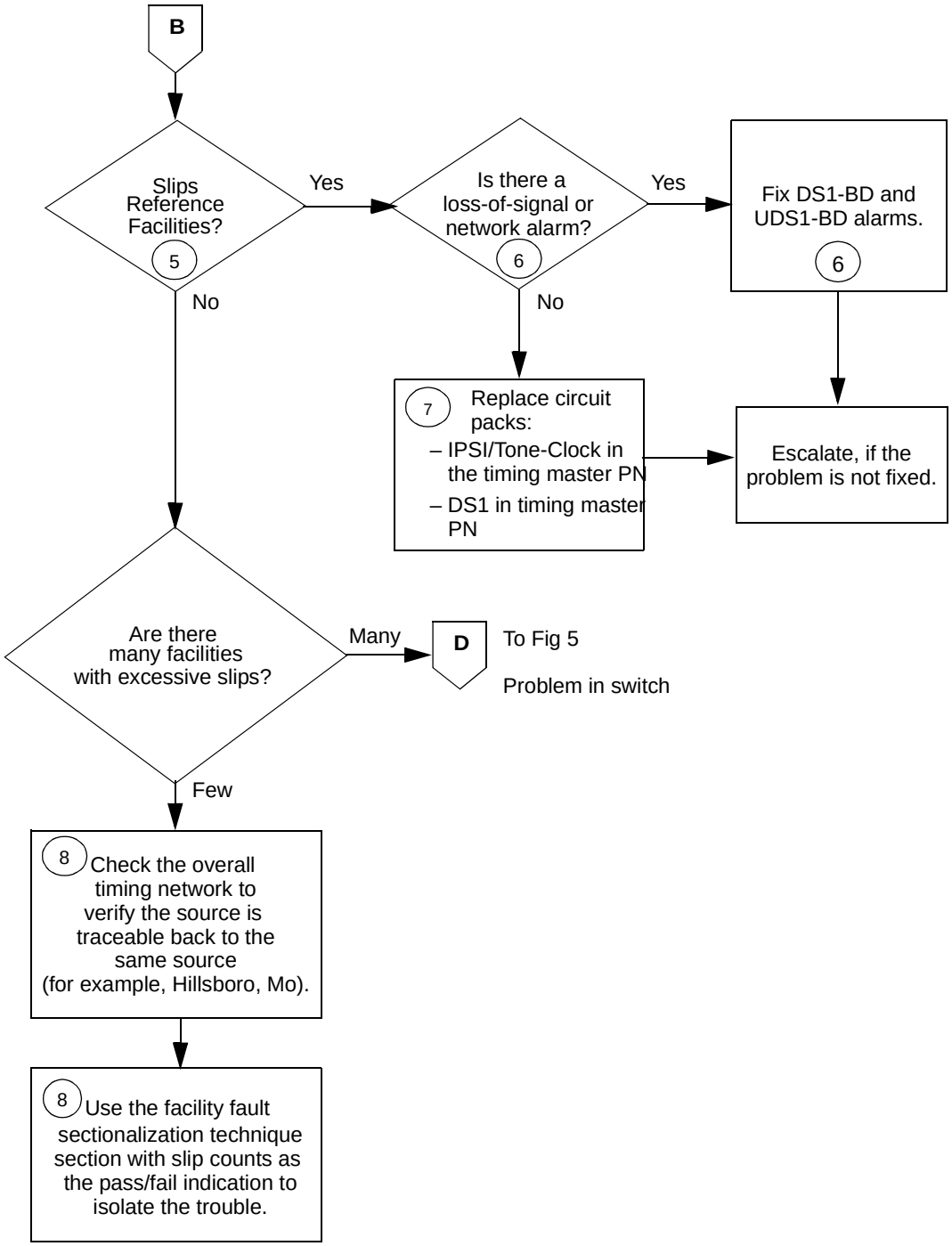


Figure 132: Synchronization Troubleshooting, Fig. 4 of 6

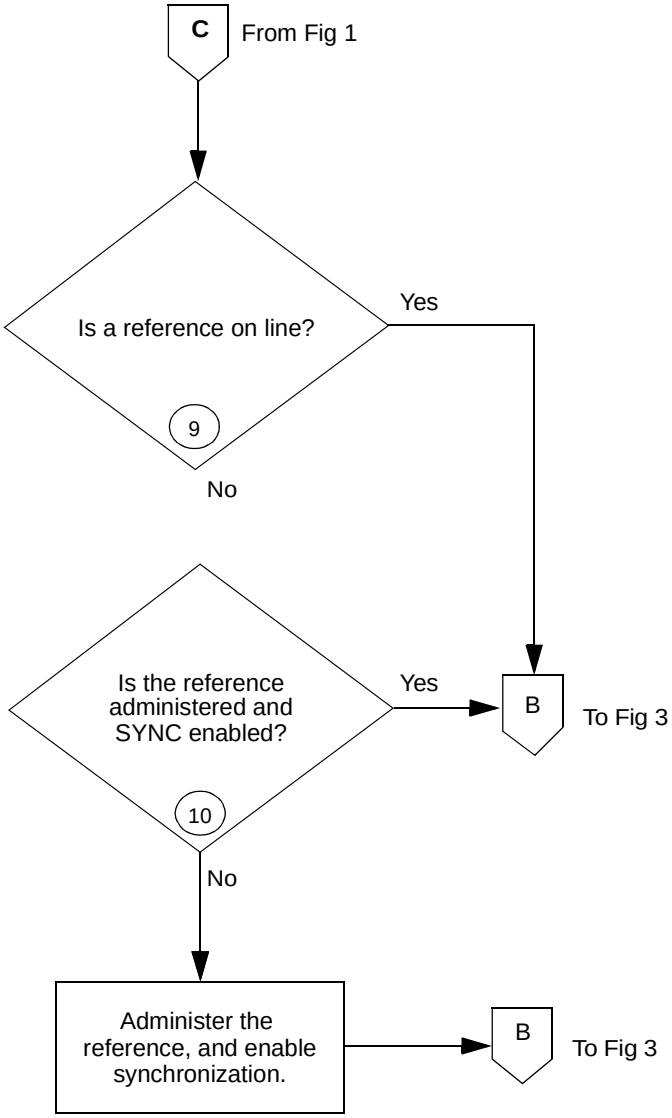


Figure 133: Synchronization Troubleshooting, Fig. 5 of 6

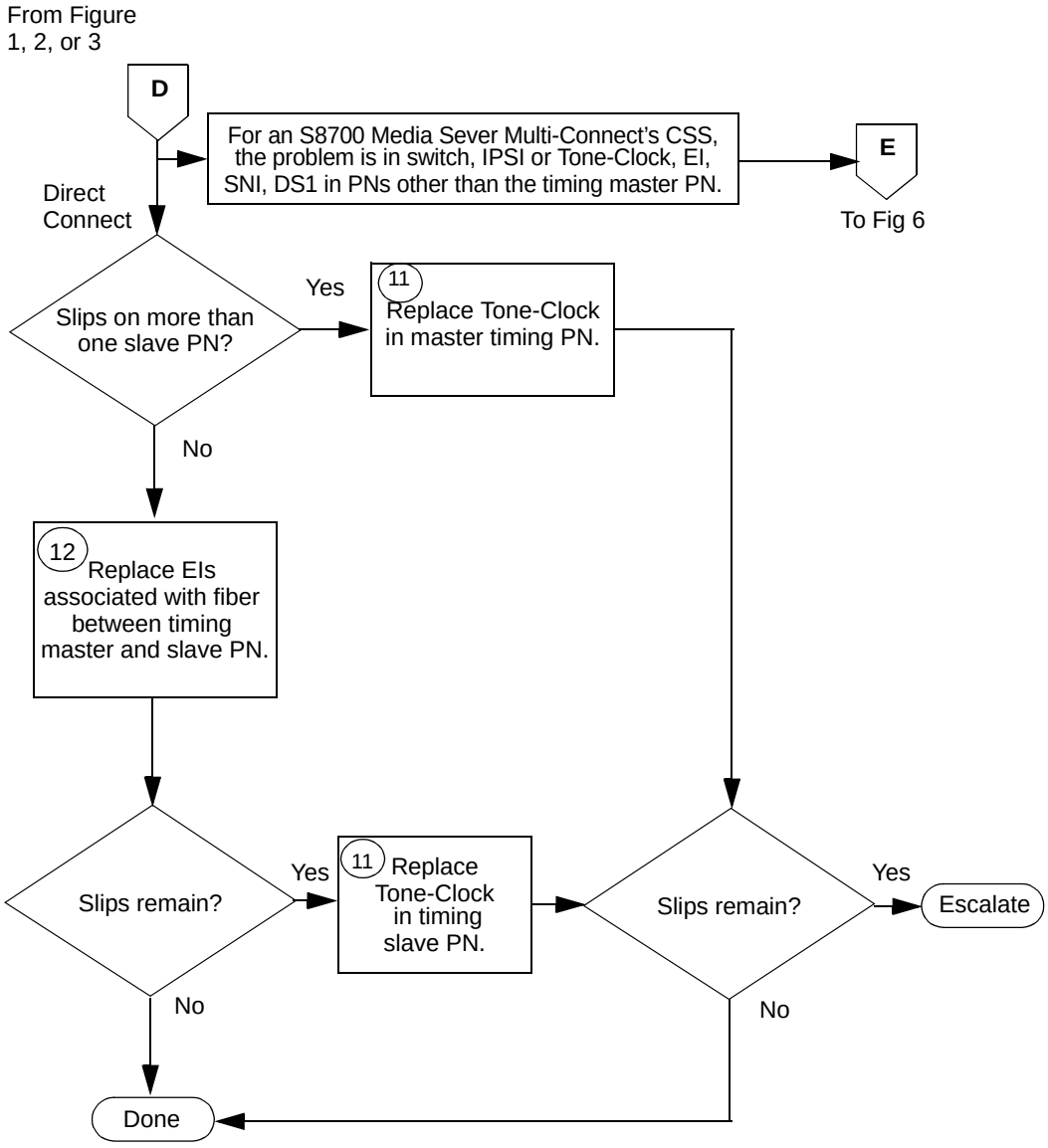


Figure 134: Synchronization Troubleshooting, Fig 6 of 6

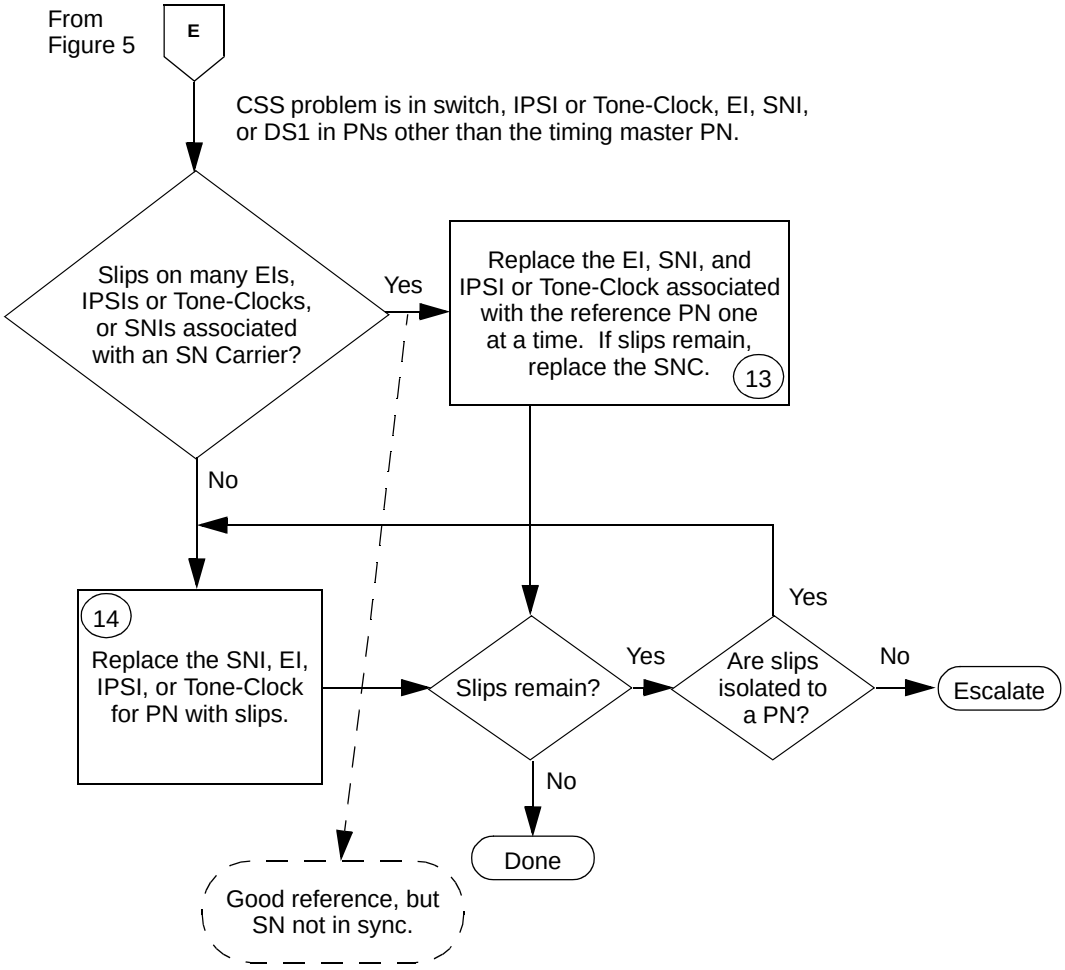


Figure 135: Synchronization Troubleshooting, Fig. 1 of 4

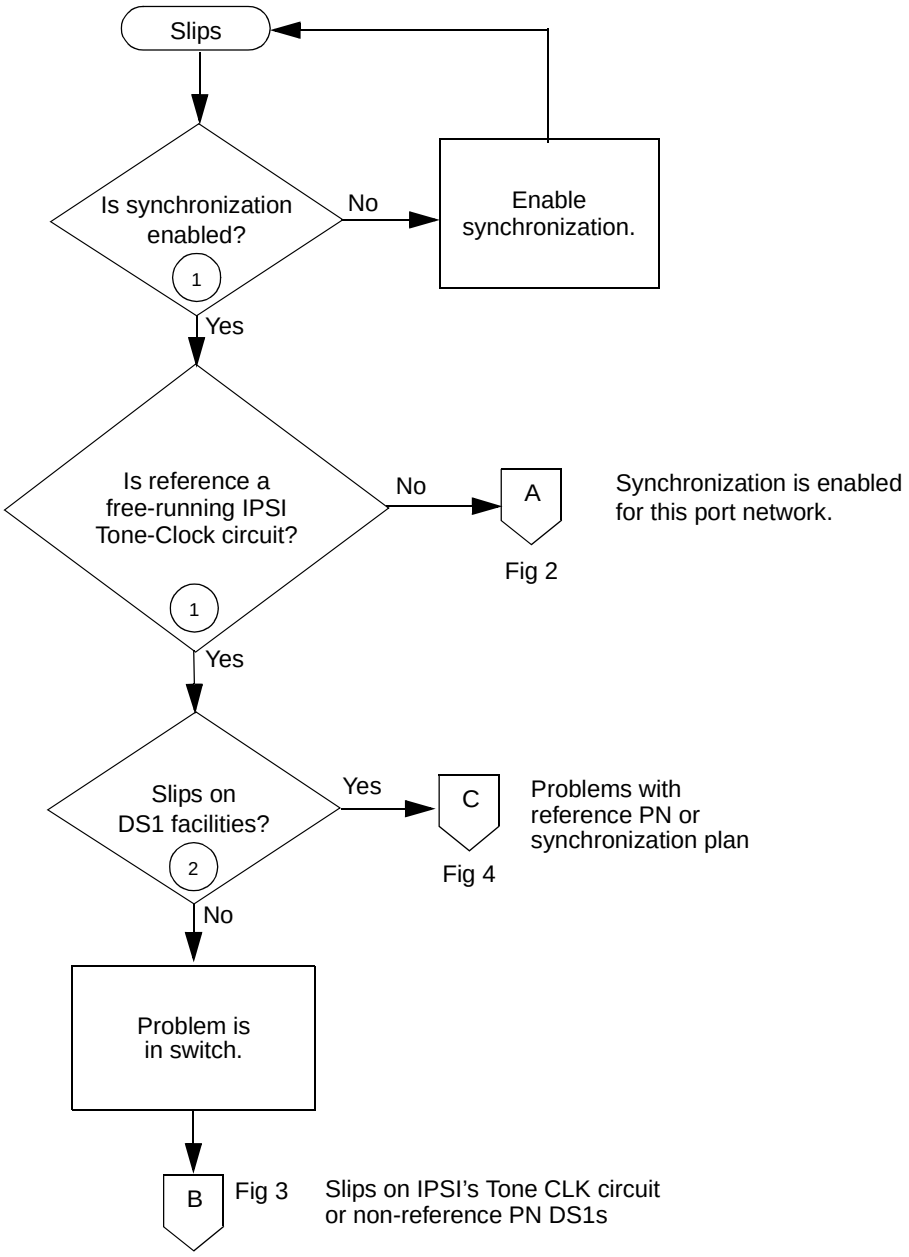


Figure 136: Synchronization Troubleshooting, Fig. 2 of 4

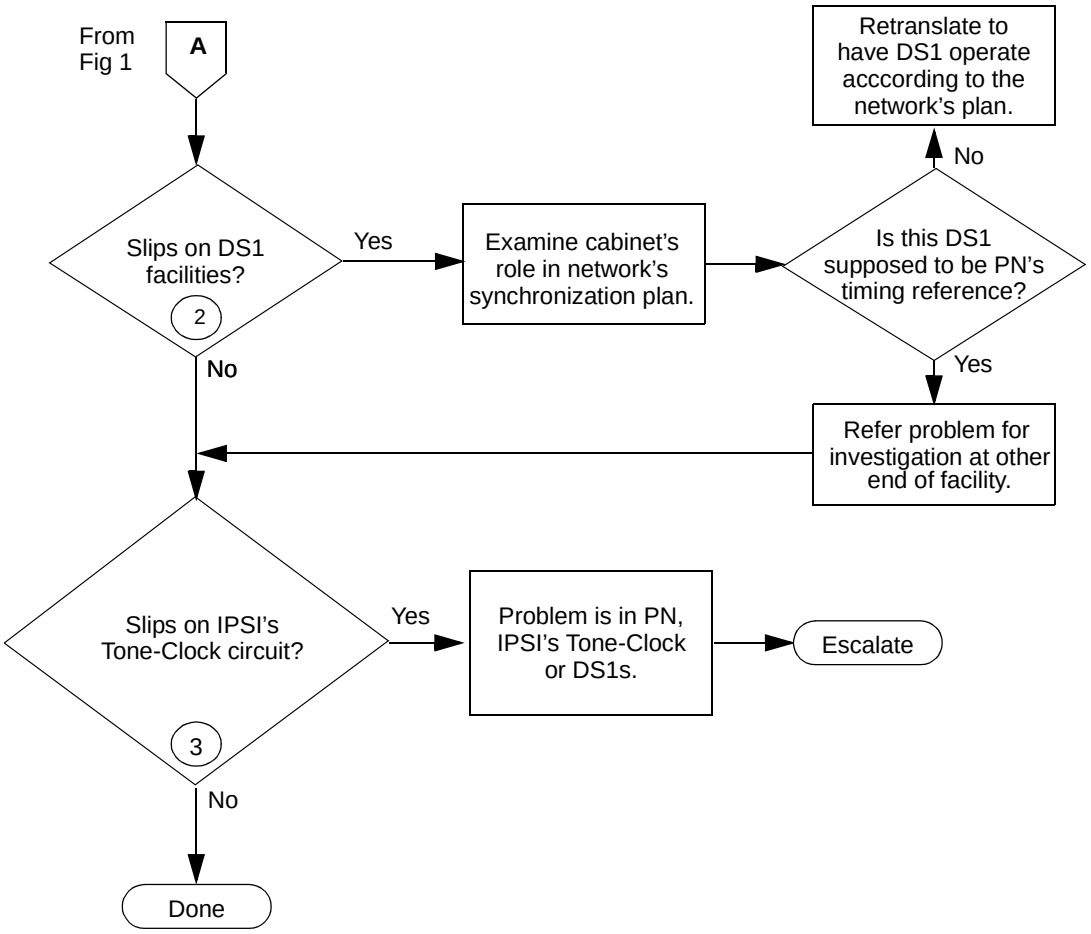


Figure 137: Synchronization Troubleshooting, Fig. 3 of 4

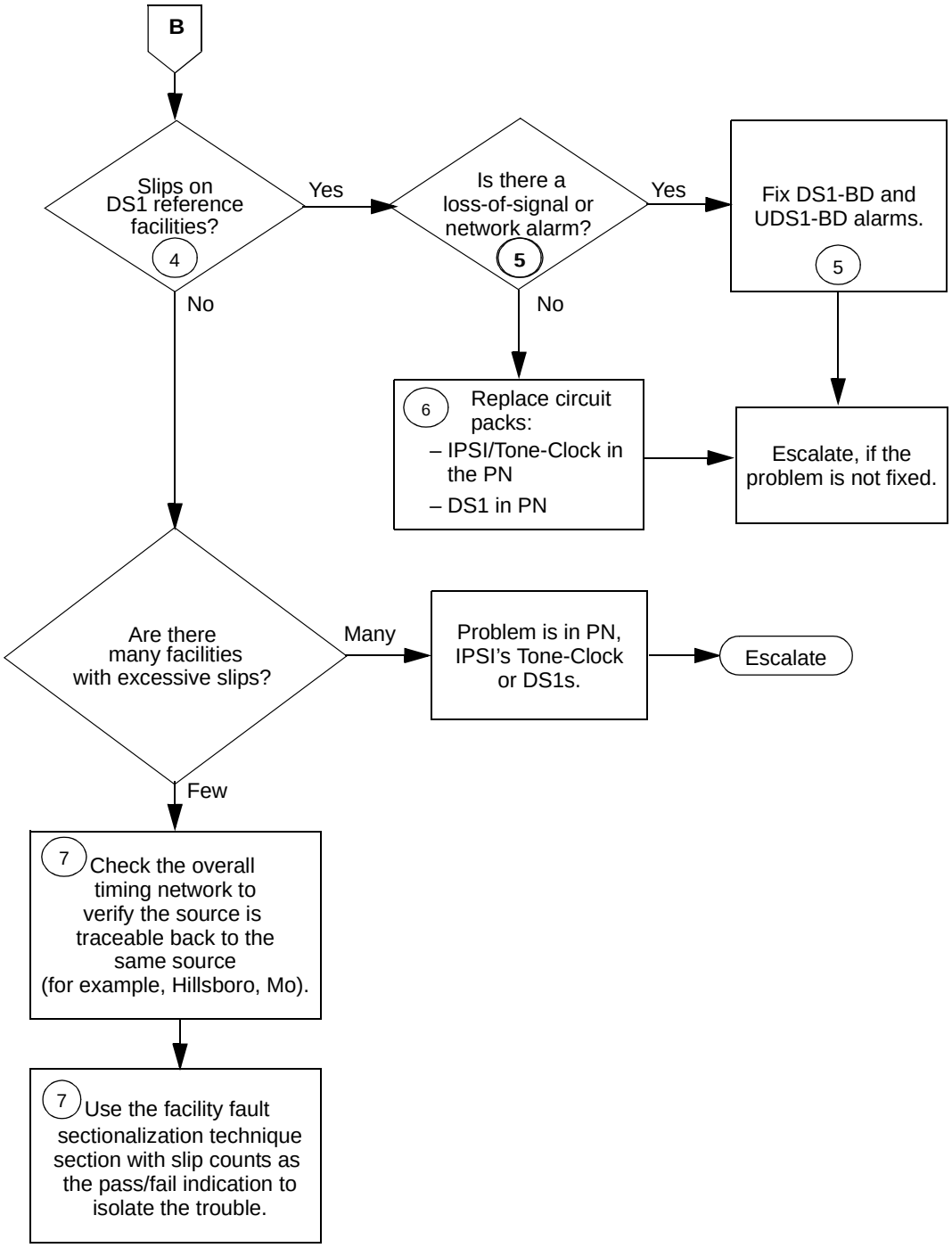
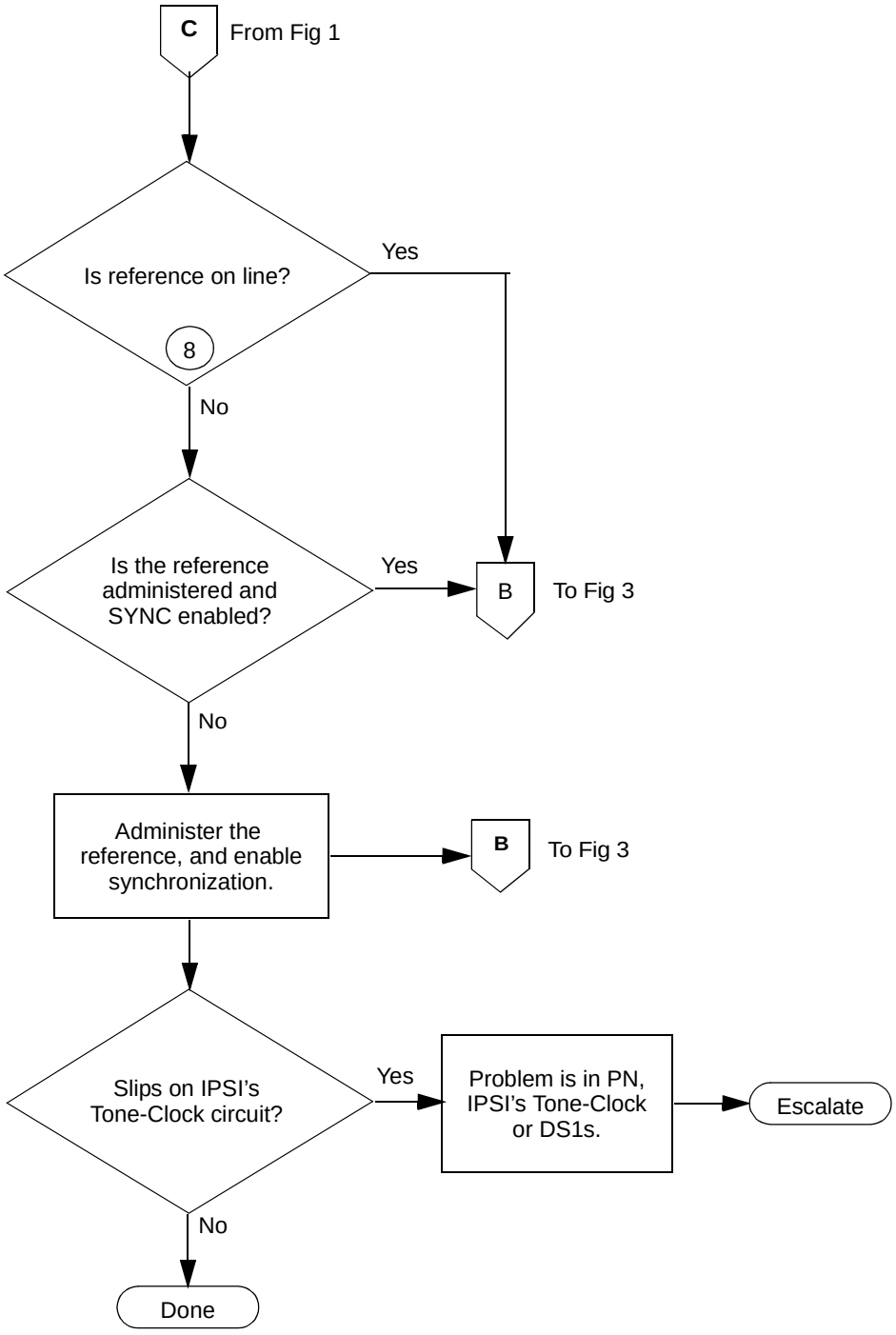


Figure 138: Synchronization Troubleshooting, Fig. 4 of 4



Notes for Sheet 1 through Sheet 6 flowcharts. (When checking for slip errors, use the previous Table 764, Error Log Entries for Slip Errors, on page 1756 and Figure 135, Synchronization Troubleshooting, Fig. 1 of 4, on page 1764.):

1. Use **status synchronization** to see if synchronization is enabled, and to determine the on-line reference. If the on-line reference is a Tone-Clock board, the switch is operating in free run mode.

   S8700 MC: If Stratum 3 is displayed, and no DS1s are connected to the Stratum-3 clock or no DS1 connection existed to the Stratum-3 clock for over 24 hours, then the Stratum-3 clock is in free run mode.

2. Check for slip errors against DS1-BD and UDS1-BD.

3. **S8700 MC**: If Stratum 3 is administered (**display synchronization**) and on-line (**status synchronization**), check for DS1-BD or UDS1-BD slip errors for the DS1(s) or UDS1(s) used as input to the Stratum-3 clock. Check the LED indications on the Stratum-3 clock to determine which DS1 is providing input to Stratum 3, and examine the cross-connect information for that DS1.

4. Check for slips errors against EXP-INTF, SNI-BD, and TDM-CLK.

5. Check **status synchronization** for the current DS1 reference. If a DS1 or UDS1 is on-line, check for slips on that DS1 or UDS1.

6. Check for LOS, Blue, Yellow, and Red alarms on the on-line reference facility, and fix those problems first. See the DS1-BD and/or UDS1-BD for the error log entries associated with the previously mentioned alarms. Replace the circuit packs one at a time and wait at least 1 hour to determine if the problem went away. This procedure is disruptive and should be done after hours if possible.

   S8700 MC: Instead of replacing the Tone-Clock circuit pack in systems where Tone-Clocks are duplicated, run **set tone-clock** to interchange Tone-Clocks. If the problem goes away, replace the previously active Tone-Clock.

7. If a few facilities experience slips or are unusable references, the clock source for facilities with slips or that are unusable is not traceable to the same ultimate source as the clock source for the on-line reference facility.

   Examine the overall timing network for the interconnected DS1 to determine if the:

   - Clock can be traced back to a single source
   - Reference designations for each location in the distribution of timing is supplied in accordance with a *synchronization plan*

   Examine the capability of the external transmission equipment to pass or provide timing.

   Verify the integrity of the on-site hardware by using "Facility Fault Sectionalization" on page 1769. This:

   - Loops the transmit signal to the receive signal
   - Verifies that the excessive slips or the unusable reference are no longer observed

   This is a time-consuming process that disrupts service. Perform it after hours if the service provided by the system is acceptable as determined by the customer.

8. Use **status synchronization** to determine the on-line reference. If a DS1 reference is not on-line and the local oscillator of a Tone-Clock board is on-line, then the answer to this question is **no**.

9. Use **display synchronization or list synchronization** to find out what references, if any, are administered. Use **status synchronization** to find out if synchronization is enabled.

10 **S8700 MC**: For a high- or critical-reliability system, use **set tone-clock** to interchange IPSI circuit packs' Tone-Clock circuits or Tone Clock circuit packs. If slips go away, replace the previously active Tone-Clock.

11 **S8700 MC**: Use **list fiber-links** to determine the EIs on the active PN and the EIs associated with the slave PN. If the switch does not have duplication, the EIs are all on the active PN.

12 **S8700 MC**: Replace the circuit packs one at a time, and wait at least 1 hour to determine if the problem has gone away. This procedure is disruptive and should be done after hours if possible.

Instead of replacing the EI and SNI in systems where the PNC is duplicated, perform a PNC interchange via **reset pnc interchange**. If the problem goes away, replace either the EI or the SNI on the previously active PNC. Replace one at a time and make the PNC active again to see if the problem is fixed.

Instead of replacing the Tone-Clock circuit pack in systems where the Tone-Clocks are duplicated, run **set tone-clock** to interchange Tone-Clocks. If the problem goes away, replace the previously active Tone-Clock.

Also, before replacing an SNC circuit pack, use **set switch-node-clock** if SNCs are duplicated in the carrier. If the problem goes away, replace the previously active SNC.

13 **S8700 MC**: Replace the circuit packs one at a time and wait at least 1 hour to determine if the problem has gone away. This procedure is disruptive and should be done after hours if possible.

Instead of replacing the EI and SNI in systems where the PNC is duplicated, perform a PNC interchange via **reset pnc interchange**. If the problem goes away, replace either the EI or the SNI on the previously active PNC. Replace one at a time and make that PNC active again to see if the problem is fixed.

Instead of replacing the Tone-Clock circuit pack in systems where the Tone-Clocks are duplicated, run **set tone-clock** to interchange Tone-Clocks. If the problem goes away, replace the previously active Tone-Clock.

Also, before replacing an SNC circuit pack, use **set switch-node-clock** if SNCs are duplicated in the carrier. If the problem goes away, replace the previously active SNC.

Facility Fault Sectionalization

DS1 facility fault sectionalization involves looping around the DS1 signal at on-site access points to localize the source of the problem to equipment and wiring on either the near side or far side of the loop-around point.

WARNING:

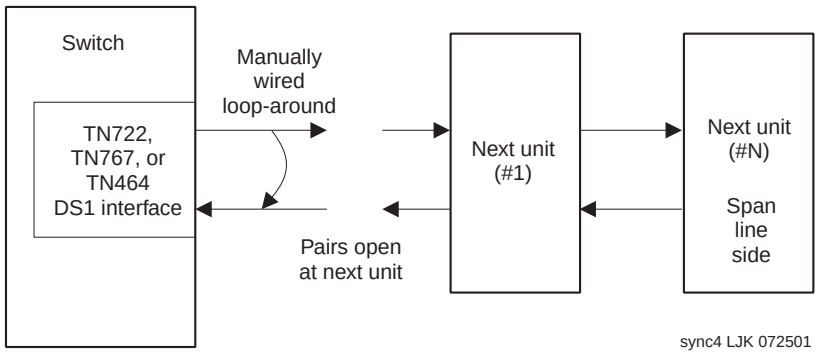
The facility fault sectionalization technique disrupts service. When you perform the loop around on a facility, make sure it is not the on-line synchronization reference or a system outage will occur.

When you use this technique to investigate problems on facilities with multiplex or DACS equipment, the technique becomes cumbersome because every 64-kbps (B channel) or subrate channel corresponding to the DS1 facility needs to be looped around.

<Link>Figure 139 shows a sequence of units (1 though n) that may be connected as the on-site equipment. A typical example is the case where the only on-site equipment is channel-terminating equipment designated Unit #1. A more complex, less typical example might have a DACS as Unit #1, a protection switch as Unit #2, and a DS1-level microwave radio system as Unit #3.

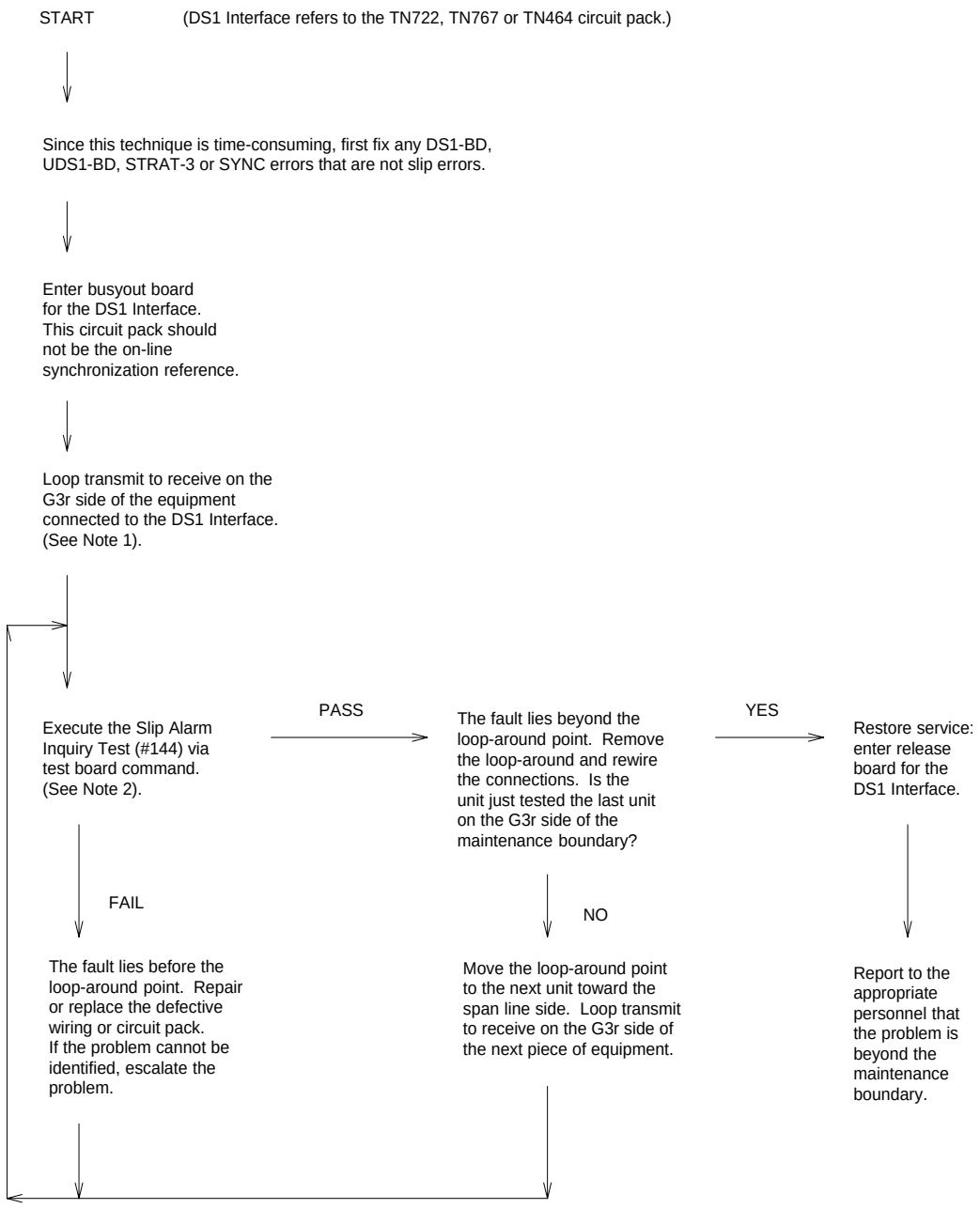
The flowchart in <Link>Figure 140 on page 1771 gives an overview of the facility fault sectionalization technique. It is important that you know the configuration and wiring of the equipment for the problem facility in order to support this technique.

Figure 139: Manual Loop-Around for Facility Fault Sectionalization



Since the technique is time consuming, fix any DS1-BD, UDS1-BD, STRAT-3, or SYNC errors first that are not slip errors.

Figure 140: Facility Fault Sectionalization



Notes to Facility Fault Sectionalization Flowchart

1 Loop transmit to receive on the system side.

Remove the transmit signal from the TN722, TN767, or TN464 circuit pack inputs and outputs and loop it around to the receive signal going toward the TN722, TN767, or TN464 circuit pack at the first unit wired to the TN722, TN767, or TN464 circuit pack.

The loop-around signal may take different forms depending on the installation.

- In some cases, the unit connected to the system may provide a switch or a terminal interface to control the desired loop around. Make sure that the signal is looped toward the system and that the timing signal is looped.
- In most cases, it may be necessary to temporarily rewire connections at the cross-connect fields to loop the signal back toward the switch.

The point at which the signal is looped should be one at which physical access is easy and where the signal level is within the line compensation (i.e. equalization) range of the hardware connected. A few cases exist where access to the loop around cannot be easily provided at locations where the signal level is within the line compensation range of the hardware. Use **change ds1 *UUCSS*** to change the line compensation.

2 Execute **test board *UUCSS*** for the TN722, TN767 or TN464. Look at results of Test #144, the Slip Alarm Inquiry test. When this test fails, the error code gives the number of slips detected since the last Slip Inquiry test was run. If the test fails, run it at least one more time to ensure that slips have occurred since the loop around was installed.

Timing Loops

A timing loop exists when a system receives timing from another system whose timing reference is directly or indirectly derived from itself. The system synchronization planner *must avoid creating a timing loop* when administering the synchronization references in a system. Timing loops can lead to loss of digital data between systems that are exchanging data with any system within the loop. An invalid timing signal will also be generated by any system within the loop, thus propagating the invalid timing signal to any system(s) using a system within the loop as a synchronization reference.

A correctly designed network has no loops, and each piece of equipment in the network is supplied by a clock with an equal or lower stratum number. (For example, the inputs to a Stratum-3 clock should never be from a Stratum-4 device.)

CAUTION:
Synchronization administration changes should never be done without consulting the network's overall synchronization plan. If you suspect that synchronization administration changes are needed, follow normal escalation procedures.

Synchronization Switches away from Current Timing Reference

Synchronization changes away from a DS1 reference (primary or secondary) if the current DS1 reference does not provide a valid timing signal. The other DS1 reference is used if one is administered and providing a valid timing signal. Otherwise, the local oscillator of the Tone-Clock circuit pack in the same port network as the DS1 reference is used. The following conditions cause a synchronization switch:

- The current DS1 reference is not inserted (**list configuration board *UUCSS*** shows "no board").
- The current DS1 reference has a loss of signal error (DS1-BD and UDS1-BD error type 1281), a blue alarm error (DS1-BD and UDS1-BD error type 1793), a red alarm error (DS1-BD and UDS1-BD error type 2049), or a hyperactive angel error (DS1-BD and UDS1-BD error type 1538). A corresponding alarm log entry is not required.
- DS1 and UDS1 circuit packs can be administered with slips detection enabled (the **Slip Detection** field is **y**) (see **add ds1**, **change ds1**, and **display ds1**). When over half of the DS1 and UDS1 circuit packs administered as slip enabled experience slips, and the primary or secondary

synchronization reference is the current synchronization reference, synchronization tries the other administered synchronization reference if the other administered reference does not have the previous two conditions. Use **list measurements ds1-log** to get an historical perspective of DS1 facility operation.

The following conditions cause a change to the other DS1 reference if one exists and the other DS1 reference is more healthy:

- The current DS1 reference has a misframe error (DS1-BD error type 3329 to 3345 or UDS1-BD error type 3585-3601). A corresponding alarm log entry is not required.
- The current DS1 reference has a slip alarm (DS1-BD and UDS1-BD error type 3073 to 3160). A corresponding alarm log entry is required.

If the previous conditions are repaired, synchronization changes back to the primary reference.

LEDs on Tone-Clock Circuit Packs

The specific flashing pattern of a TN768, TN780, or TN2182 Tone-Clock circuit pack's amber and green LEDs indicates the circuit pack's status. For example, these flashing LED patterns indicate whether the Tone-Clock circuit pack is:

- Deriving timing from an external source
- Providing the timing signal for its PN

The amber and green LED patterns for TN768, TN780, and TN2182 Tone-Clock circuit packs are as follows:

Table 766: Tone-Clock Amber/Green LED Flashing Codes

Circuit Pack Condition	Tone-Clock State	Explanation
[1]flashing amber 2.7 seconds on 0.3 seconds off	active	An external timing source is being used as a synchronization reference.
flashing amber 0.3 seconds on 2.7 seconds off	active	The circuit pack is being used as a synchronization reference.
steady amber on	active	The circuit pack has been reset, but has not been told which synchronization reference source to use.
steady amber off	standby	The circuit pack is in standby mode (neither generating tones nor supplying clocks).
"jingle bells" green and amber 0.1 seconds on, 0.2 seconds off, 0.1 seconds on, 0.4 seconds off, 0.4 seconds on, 0.4 seconds off	standby	The system is running maintenance tests on the standby Tone-Clock circuit pack. (The standby circuit pack is providing tones.)
other green and amber	active	The system is running maintenance tests on the active Tone-Clock circuit pack.

1 The external synchronization reference being used is a primary reference, or a secondary reference., or an external Stratum-3 clock when the Tone-Clock is in the master PN. The external synchronization reference used in a slave PN is an Expansion Interface circuit pack.

Error Log Entries and Test to Clear Values

S8700 / S8500

Table 767: Synchronization Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test synchronization**
1 (a)*(h)		None	WARNING/MINOR (h)(f)	OFF	None
18 (b)	0	**disable sync**	WARNING	OFF	**enable sync**
257 (c)*(h)		None	WARNING/MINOR (h)(f)	OFF	None
513 (d)*(h)		None	WARNING/MAJOR (h)(f)	OFF	None
769 (e)		None	MAJOR	OFF	None
1793 (f)[2]	0–50	None	MAJOR	OFF	None
2049 (g)[2]	0	None	WARNING	OFF	None

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each test's description, and follow its recommended procedures.

2 It may take up to 1 hour for these alarms to clear.

Error Notes:

a This error indicates a problem with the primary DS1 reference. It is cleared when the primary reference is restored. To find the problem's source:

1. Enter **list configuration board *UUCSS*** to check if the primary DS1 Interface circuit pack is inserted in the carrier.
2. Verify that the administered primary reference matches the DS1 reference from the network synchronization plan.
3. Enter **test board *UUCSS* long** to test the primary DS1 Interface circuit pack.

   Check the Error Log for DS1-BD or UDS1-BD errors and see DS1-BD (DS1 Interface Circuit Pack) on page 760 or UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 to resolve errors associated with the primary DS1 (DS1 or UDS1) interface circuit pack.

   If the only errors against DS1-BD or UDS1-BD are slip errors, follow the procedures described in the previous troubleshooting section. If no errors are listed in the Error Log for the primary DS1 Interface circuit pack, continue with the following steps.
4. Enter **test tone-clock *UUC* long** to test the active Tone-Clock circuit pack in the master port network.

   Check the Error Log for TDM-CLK errors, and verify that TDM Bus Clock Circuit Status Inquiry test (#148), passes.

   If Test #148 fails with Error Code 2–32, see TDM-CLK (TDM Bus Clock) on page 1847 to resolve the problem. If not, continue with the following.

5 Use **disable synchronization-switch** and **enable synchronization-switch**. When these two commands are used together, they change the system synchronization reference to the primary DS1 Interface circuit pack.

6 Check the Error Log and use **status synchronization** to verify that the primary DS1 Interface circuit pack is still the system synchronization reference.

If the primary DS1 Interface circuit pack is not the system synchronization reference, **and** the master port network does not have duplicate Tone-Clock circuit packs, escalate the problem.

Otherwise, continue with the following.

7 For ***duplicated*** Tone-Clock circuit packs in the master port network:

Enter **set tone-clock *UUC*** to interchange Tone-Clocks in the master port network, and repeat the disable/enable commands described in the previous step.

b This error indicates that Synchronization Maintenance was disabled via **disable synchronization-switch**. Use **enable synchronization-switch** to enable Synchronization Maintenance reference switching and to resolve this alarm.

c This error indicates a problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (a) to resolve this error substituting **secondary** for **primary** in the preceding resolution steps.

d This error indicates that the Tone-Clock circuit pack is providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

e **S8700 MC**: This error indicates that the external Stratum-3 clock failed to provide the system's timing reference. Refer to Stratum-3 clock's Maintenance document to resolve the defective synchronization reference.

f This error indicates excessive switching of system synchronization references has occurred. When this error occurs, synchronization is disabled and the Tone-Clock circuit pack (in the master port network) becomes the synchronization reference for the system. Execute the following steps to resolve this error:

1 Check for timing loops, and resolve any loops that exist.

2 Test the active Tone-Clock circuit pack in the master port network via **test tone-clock *UUC* long**.

Check the Error Log for TDM-CLK errors, and verify that TDM bus Clock Circuit Status Inquiry test (#148) passes.

If Test #148 fails with Error Code 2–32, see TDM-CLK (TDM Bus Clock) on page 1847 to resolve the problem. If not, continue with the following.

3 For ***duplicated*** Tone-Clock circuit packs in the master port network, enter **set tone-clock *UUC*** command to switch the Tone-Clocks.

For ***unduplicated*** Tone-Clock circuit packs in the master port network of a Stratum-4 (not Stratum-3) system, replace the primary and secondary (if assigned) DS1 Interface circuit packs.

4 Investigate any other SYNC or STRAT-3 errors.

S8700 MC

g This error indicates that the Expansion Interface circuit packs are experiencing timing slips. This error increases the bit error rates for data transmission between port networks. The Expansion Interface circuit packs with timing slips have EXP-INTF error 2305.

1. Check the LEDs on the active Tone-Clock circuit packs in the system and verify that the system is properly synchronized.
2. Verify that all the TDM/LAN Bus cables on the backplane are marked WP-91716. Also for a Multi-Carrier Cabinet (MCC), check that the bus terminator type is a ZAHF4 TDM/LAN.

   For a Single Carrier Cabinet verify that the bus terminator type is a AHF110 TDM/LAN.
3. Check for timing loops, and resolve any loops that exist.
4. Check the Error Log for any active as well as resolved Expansion Interface circuit pack errors and see EXP-INTF (Expansion Interface Circuit Pack) on page 911 to resolve any errors found.
5. Duplicated Tone-Clock circuit packs in the slave port networks:
   - Interchange Tone-Clock circuit packs in the slave port networks where EXP-INTF error 2305 also occurs via **set tone-clock *UUC***. The error count for this error should start decrementing once the problem is solved. If the count does not decrease in 15 minutes, the problem still exists.
   - If the problem still exists, switch the Tone-Clock in the slave port network back to the previous configuration, then perform a PNC interchange via **reset pnc interchange**.
   - If the problem still exists, switch the PNC back to the previous configuration via **reset pnc interchange**. Switch the Tone-Clock circuit packs in the master port network via **set tone-clock *UUC***.
   - If the problem still exists, switch the Tone-Clock circuit packs in the master port network back to the previous configuration via **set tone-clock *UUC***.
   - Replace the active Expansion Interface circuit pack in the master port network.
   - In a CSS configuration, replace the Switch Node Interface circuit pack connected to the active Expansion Interface circuit pack in the master port network. Use **list fiber-link** to determine the Switch Node Interface circuit pack that is connected to the active Expansion Interface circuit pack in the master port network.
   - If the system's synchronization reference is a Tone-Clock circuit pack or a Stratum-3 clock, follow normal escalation procedures.

     If the system's primary synchronization reference is a DS1 Interface circuit pack, assign a different DS1 Interface as the primary reference. If the problem persists and slip errors remain, follow the procedures in the troubleshooting section above.
6. For *unduplicated* Tone-Clock circuit packs in a slave port network:
   - Enter **set tone-clock *UUC*** to switch the Tone-Clock in the master port network.
   - If the problem still exists, enter **set tone-clock *UUC*** to switch the Tone-Clocks in the master port network back to their previous configuration.

     Enter **test tone-clock *UUC* long** to test the Tone-Clock in the master and slave port networks.

Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Circuit Status Inquiry test (#148) passes.

If Test #148 fails with an Error Code 2–32, see TDM-CLK (TDM Bus Clock) on page 1847 to resolve the problem. If not, continue with the following steps.

- If the master and slave Tone-Clock circuit packs do not fail TDM Bus Clock Test #150 (TDM Bus Clock PPM Inquiry test), replace the Expansion Interface circuit packs that have EXP-INTF error 2305.
- If the system synchronization reference is a Tone-Clock circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, follow the steps listed in “TDM-CLK” to replace the master Tone-Clock circuit pack.
- If the system’s synchronization reference is a DS1 Interface circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock test (#150), the primary or secondary (if administered) synchronization references are not providing valid timing signals for the system.

  If the **primary** synchronization reference is providing the system’s timing, check the synchronization references administered, and follow the steps outlined in note (a). If the **secondary** reference is providing timing, follow note (c).
- If the slave Tone-Clock circuit pack fails TDM Bus Clock Test #150 but the master Tone-Clock *does not* fail this test, the master Tone-Clock circuit pack must be replaced. Follow the Tone-Clock replacement steps listed in “TDM-CLK”.
- Replace the active Expansion Interface circuit pack in the master port network.
- In a CSS configuration, replace the Switch Node Interface circuit pack connected to the active Expansion Interface circuit pack in the master port network. Use **list fiber-link** to determine the Switch Node Interface circuit pack that is connected to the active Expansion Interface circuit pack in the master port network.
- If the problem persists and any slip errors remain, follow the procedures described in the troubleshooting section above.

This error is cleared by a leaky bucket strategy, and takes one hour to clear the error counter once it is alarmed. Therefore, it may take up to one hour to clear the alarm after the problem is cleared.

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h Noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a sync problem occurs on error types 1, 257, or 513, a WARNING alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MINOR or MAJOR alarm.

S8100

Table 768: Synchronization Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test synchronization
1 (a)	Any	None	WARNING/ MINOR (j)[2]	OFF	None
18 (b)	0	disable sync	WARNING	OFF	enable sync

Table 768: Synchronization Error Log Entries *Continued*

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
257 (c)	Any	None	WARNING/ MINOR (j)[2]	OFF	None
513 (d)	Any	None	WARNING/ MAJOR (j)[2]	OFF	None
769 (e)		None	MAJOR/ WARNING[3]	OFF	None
1793 [4]	0-50	None	MAJOR/ WARNING	OFF	enable sync
2049 (f) (h)[4]	0	None	WARNING	OFF	None
2305 (g) (h)[4]	0	None	WARNING	OFF	None

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1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

2 This error type initially raises a Warning alarm. If this error type persists and alarms are not downgraded on this MO due to the value of **set options**, then, after a period of time, a Minor or Major alarm is raised.

3 Major alarms on this MO may be downgraded to Warning alarms based on the value used in the **set options** command.

4 It may take up to one hour for these SYNC alarms to clear due to "leaky bucket" strategy.

Error Notes:

a This error indicates a problem with the primary DS1 reference. It is cleared when the primary reference is restored. The following steps should give an indication of the source of the problem:

1 Check if the primary DS1 interface circuit pack is inserted in the carrier via the **list configuration board PCSS** command.

2 Check the connection of the cable supplying the external timing source to the primary DS1 interface circuit pack.

3 Test the primary DS1 interface circuit pack via the **test board PCSS long** command. Check the Error Log for DS1-BD errors and refer to the DS1-BD (DS1 Interface Circuit Pack) Maintenance documentation to resolve any errors associated with the primary DS1 interface circuit pack. If no errors are listed in the Error Log for the primary DS1 interface circuit pack, continue with the following steps.

4 Test the active Tone-Clock circuit pack in the master port network via the **test tone/clock PC long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to TDM-CLK (TDM Bus Clock) on page 1847 to resolve the problem. If not, continue with the following steps.

5 Execute the **disable synchronization-switch** and the **enable synchronization-switch** commands. These two commands (when executed together) switch the system synchronization reference to the primary DS1 interface circuit pack. Check the Error Log and execute the **status synchronization** command to verify that the primary DS1 interface circuit pack is still the system synchronization reference. If the primary DS1 interface circuit pack is not the system synchronization reference, continue with the following step.

b This error indicates that Synchronization Maintenance has been disabled via the **disable synchronization-switch** command. Execute the **enable synchronization-switch** command to enable Synchronization Maintenance reference switching and to resolve this alarm.

c This error indicates a problem with the secondary DS1 reference. It is cleared when the secondary reference is restored. Refer to note (a) to resolve this error substituting **secondary** for **primary** in the preceding resolution steps.

d This error indicates that the Tone-Clock circuit pack is providing the timing source for the system. The primary and secondary (if administered) are not providing a valid timing signal. Investigate errors 1 and 257 to resolve this error.

e This error indicates excessive switching of system synchronization references has occurred. When this error occurs, synchronization is disabled and the Tone-Clock circuit pack (in the master port network) becomes the synchronization reference for the system. Execute the following steps to resolve this error:

1. Check for timing loops and resolve any loops that exist.
2. Test the active Tone-Clock circuit pack in the master port network via the **test tone/clock PC long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to the TDM-CLK (TDM Bus Clock) Maintenance documentation to resolve the problem. If not, continue with the following steps.
3. Replace the primary and secondary (if administered) DS1 Interface circuit packs.
4. Check for an error logged against the primary or secondary DS1 board. If there is an error, follow the DS1 section to resolve the errors. If there is not, enter **enable sync**, and wait for two to five minutes for the primary sync source to come on-line.

f This error indicates that the slave Tone-Clock circuit pack is experiencing loss of signal. Refer to note (i) for error resolution steps.

g The following steps should be executed to resolve error 2049 and 2305:

1. Check for timing loops, and resolve any loops that exist.
2. Error 2049:
   - Test the Tone-Clock circuit packs in the master and slave port networks via the **test tone/clock PC long** command. Check the Error Log for TDM-CLK errors and verify that TDM Bus Clock Test #148 passes successfully. If Test #148 fails with an Error Code 2 through 32, refer to “TDM-CLK” to resolve the problem. If not, continue with the following steps.
   - If the system synchronization reference is a Tone-Clock circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, follow the steps listed in “TDM-CLK” to replace the master Tone-Clock circuit pack.
   - If the system synchronization reference is a DS1 interface circuit pack and the master Tone-Clock circuit pack fails TDM Bus Clock Test #150, the primary or secondary (if administered) synchronization references are not providing valid timing signals for the system. Check the system synchronization references administered, and follow the steps outlined in note (a) if the primary synchronization reference is providing timing for the system or note (c) if the secondary synchronization reference is providing timing for the system.
   - If the slave Tone-Clock circuit pack fails the TDM Bus Clock Test #150 but the master Tone-Clock **does not** fail this test, the master Tone-Clock circuit pack must be replaced. Follow the procedure in Tone-Clock Replacement on page 1546.

     If SLIP errors remain follow SLIP ANALYSIS.

3 Error 2305:

- If the problem persists, replace the Tone-Clock circuit pack in the slave port network. Follow the steps listed in “TDM-CLK” to replace the Tone-Clock circuit pack.

h Noise on the DS1 line can cause transient alarms on synchronization. Therefore, when a synchronization problem occurs causing error types 1, 257, or 513, a WARNING alarm is first raised for 15 to 20 minutes before the alarm is upgraded to a MAJOR or MINOR alarm.

System Technician-Demanded Tests: Descriptions and Error Codes

S8700 MC: If Stratum 3 is administered via **change synchronization**, the Stratum-3 Clock Alarm Query test (#649) also executes when **test synchronization** is run. Test #649 is described in ‘‘Stratum-3 Synchronization’’.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Test Synchronization test (#417)	X	X	Non-destructive

Test Synchronization Test (#417)

This test updates every Synchronization Maintenance component with the correct information about its role in providing a system’s synchronization. This test updates every:

- IPSI circuit pack’s Tone-Clock circuit
- Tone-Clock, Expansion Interface, DS1 Interface, and UDS1 Interface circuit pack

in the system. The test either passes or aborts.

Table 769: Test Synchronization Test (#417)

Error Code	Test Result	Description / Recommendation
S8100: (blank)	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
1000	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 769: Test Synchronization Test (#417)

Error Code	Test Result	Description / Recommendation
1115	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 3 times.
	PASS	The Synchronization Maintenance component circuit-pack parameters have been successfully updated. The system should be synchronized after successful execution of this test. If synchronization problems still exist, refer to the Error Log to obtain information about the source of the problem.

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SYS-LINK (System Links)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
SYS-LINK	MINOR	**test sys-link *location***[1]	SYSTEM LINKS
SYS-LINK	WARNING	**test sys-link *location***	SYSTEM LINKS

1 For information on specifying a location, see Command Syntax on page 179

System links are packet links that originate at the Packet Interface board and traverse various hardware components to specific endpoints. The hardware components involved on the forward and reverse routes can be different, depending upon the configuration and switch administration. Various types of links are defined by their endpoints:

EAL	Expansion Archangel Link terminating at an Expansion Interface board. This link carries CCMS messages.
INL	Indirect Neighbor Link terminating at a Switch Node Interface board
PACL	PNC ATM Control Link terminating at a PNC ATM-EI board. This link carries ATM signaling commands from CaPro to the remote TN2238 (ATM-EI) boards.
PRI	ISDN-PRI D-Channel Link terminating at a Universal DS1 board
RSCL	Remote Socket Control Link terminating at a C-LAN board
RSL	Remote Socket Link terminating at a C-LAN board

Recording System Link Events

The system-links MO records every error encountered on the links. Most of these events are not extraordinary unless they occur with an alarming frequency. The events are logged as they occur, leaving a "trail" to help analyze abnormal behavior exhibited by the endpoints attached to the links or the links themselves.

When a link goes down, an alarm is raised immediately. For EAL, INL, and PACL link types a MINOR alarm is raised. For every other link type a WARNING alarm is raised. Other alarming conditions that do not cause the link to go down get a WARNING alarm, regardless of the link type.

Identifying a System Link

In order to trace problems associated with a system link, it is necessary to find its location. Use the following methods to find the location of the system link.

Display Errors/Alarms

The output of **display errors** or **display alarm** shows the location of the system link for entries with a Maintenance Name of SYS-LINK. You can restrict the scope of the output of these commands by specifying **sys-link** in the `Category` **field** on the input screen. The link type and channel number, if any, are listed under the `Alt Name` field of the report.

List sys-link

The **list sys-link** command lists every system link (location, link type, and channel number) present in the system.

> **NOTE:**
> In case of the X.25 link type, a single endpoint carries multiple links. A combination of the endpoint and channel number is used to uniquely identify the link. Every other link can be uniquely identified by its endpoint.

Common Procedure for Repairing Link Problems

The state of a system link is dependent on the state of the various hardware components that it travels over. To resolve any problems associated with a system link, use the following procedure.

The switch maintains a list of hardware components over which the link travels, called the hardware path. There are two hardware paths: the current hardware path and the faulted hardware path for each of the system links. The current hardware path is present only for those links that are currently up. When a link is down, the current hardware path is empty. The faulted hardware path is always present once the link has gone down, and is not cleared when the link subsequently recovers. The faulted path preserves the path that the link traversed when it last went down. The time at which the faulted path was last recorded is preserved and is accessible through **status sys-link *location*** and **list sys-link**. Therefore, the focus of attention for problems which do not involve a link that is down is the current hardware path. If the link is down, faulted hardware path is the focus of attention.

The **status sys-link *location*** command shows the state of both the hardware paths (current and faulted) along with the state of each of the components in the hardware path. When analyzing any system link problem:

1. Look for alarms on the components listed under desired hardware path.
2. If any alarms are present, then follow the maintenance procedures for the alarmed components to clear those alarms first.

   > **NOTE:**
   > For systems using ATM-EI (TN2305/6 circuit packs) and where link alarms are present, see ATM-EI (Expansion Interface Circuit Pack) on page 367 and Troubleshooting ATM in *Maintenance Procedures (555-245-103)*.

3. When every component is alarm free, wait for 3 minutes to allow the links to recover.
4. Test the system link (**test sys-link *PCSSpp* long clear**), and notice any tests that fail.
5. If there are any failures, fix the problems indicated by the tests and repeat the procedure.

Error Log Entries and Test to Clear Values

Table 770: Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
13 (a)		System Link Status (#985)	MINOR WARNING	OFF	
257 (b)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
513 (c)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
772 (d)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
1025 (e)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
1281 (f)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
1537 (g)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
1793 (h)			WARNING	OFF	**test sys-link** *UUCSSpp* **l cl**
S8100: 2049 (i)			WARNING	OFF	test sys-link PCSSpp l cl

Notes:

a This error indicates that the link went down. The link may have gone down or never come up. Enter **status sys-link *location*** and check the value of the `Faulted Path` field. If the value is `default`, then the link never came up. If the value is `present`, then the link came up and then went down.

1. Follow the information in "Common Procedure for Repairing Link Problems" on page 1783.
2. Wait for 3–5 minutes before checking the link state.
3. Repeat the procedure until there are no problems.

b This error indicates that the link has experienced uplink flow control, and the endpoint may be hyperactive. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

1. Follow the information in "Common Procedure for Repairing Link Problems" on page 1783.
2. Clear errors and wait for 10 minutes.

c This error indicates that the link has experienced downlink flow control, meaning that some information packets from the packet interface board have been lost. The link is reset on first occurrence and Error 1025 is also logged. The system link is alarmed if 2 or more errors of this type are detected within 10 minutes.

1. Follow the information in "Common Procedure for Repairing Link Problems" on page 1783.
2. Clear errors and wait for 10 minutes.

d This error indicates that the link experienced a temporary disconnect due to excessive resets or state transitions, meaning that the link is taken down and then brought up again. The system link is alarmed if 2 or more errors of this type are detected within 10 minutes.

1. Follow the information in "Common Procedure for Repairing Link Problems" on page 1783.
2. Clear errors and wait for 10 minutes.

e This error indicates that the link has been reset, meaning that information packets queued at the time of reset are lost. The system link is alarmed if 20 or more errors of this type are detected within 10 minutes.

1. Follow the information in "Common Procedure for Repairing Link Problems" on page 1783.
2. Clear errors and wait for 10 minutes.

f This error indicates that the link has experienced slow transmit rate because the remote endpoint is busy. The effect of this error is that the endpoint location may experience slower throughput rate and/or noisy transmission. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

1. Ensure that the remote endpoint is functioning properly.
2. Follow the information in the previous section, Common Procedure for Repairing Link Problems on page 1783.
3. Clear errors and wait for 10 minutes.

g This error indicates that the link has experienced slow transmit rate due to excessive retransmission. Possible causes may be that the switch is overrunning the endpoint, or that the endpoint is sick. The effect is that the endpoint location may experience slower throughput rate. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

1. Follow the information in Common Procedure for Repairing Link Problems on page 1783.
2. Clear errors and wait for 10 minutes.

h This error indicates that the link has experienced slow transmit rate due to unknown causes, meaning that the endpoint location may experience slower throughput rate and the Packet Interface may experience backup or congestion. The system link is alarmed if 4 or more errors of this type are detected within 10 minutes.

1. Follow the information in Common Procedure for Repairing Link Problems on page 1783.
2. Clear errors and wait for 10 minutes.

i **S8100**: This error indicates that the link has transmitted an excess amount of packets. The transmit buffers of this link have been purged. The system link is alarmed if 4 or more errors of this type are detected within 10 min.

1. Follow the Common Procedure described above.
2. Clear errors and wait for 10 min.

System Technician-Demanded Tests: Descriptions and Error Codes

Testing for system links is different from the standard test procedures for MOs. In addition to testing the system link MO, the user can test every component in the path of the system link. There are two paths preserved for the link. The current path, if present, represents the path traversed by the link currently. This path is absent when the link is down. The other path, the faulted path, is present if the link has ever

gone down or never come up. If the link came up and went down, then the faulted path is marked `present`. If the link never came up, the faulted path is marked `Defaul`t. In either case, it represents the path on which the link was attempted or established unsuccessfully.

Test command for the system links, **test sys-link *UUCSSpp***, can be specified with current or faulted as an optional argument if the user wishes to test every component in the specified path. The tests executed are the same if the user tests each component manually. In the event that the user does not specify any path, then only the tests specified for the system links are executed.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
System Link Status (#985)	X	X	non-destructive

System Link Status (#985)

This test is nondestructive. This test queries the switch for the status of the system link and verifies that every switch component has the same view of the link state.

Table 771: TEST #985 System Link Status

Error Code	Test Result	Description / Recommendation
1007	ABORT	Could not locate the system link associated with this location **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
6	FAIL	The system link is down. **1** Follow the procedure for Error Type 13.
	PASS	The system link is up.

SYS-PRNT (System Printer)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
SYS-PRNT	MINOR	**test sp-link l**	System Printer
SYS-PRNT	WARNING	**release sp-link**	System Printer

The Report Scheduler feature provides the capability to schedule printing of output screen selected administration commands on an asynchronous System Printer (SYS-PRNT) or a Personal Computer (PC). The System Printer device connects to the system via a data module (PDM, MPDM, DTDM) connected to a port on a TN754 Digital Line circuit pack which is administered as a data extension. A System Printer device can also be connected through an ADU to a port on TN726B Data Line circuit pack. The System Printer link to the processor is via a C-LAN board. For information about C-LAN connectivity, see CLAN-BD (Control LAN Circuit Pack) on page 599.

System Printer Link Maintenance provides a strategy for maintaining the link between the system and an external SYS-PRNT output device. The strategy includes a set of tests for detection of errors during normal operation, troubleshooting actions, and alarms for serious problems. System Printer Link Maintenance uses a try-and-wait mechanism for maintaining the SYS-PRNT link. A minor alarm is raised when the link set-up fails. A warning alarm is raised when the server has been busied out. up to two link retry attempts is made. After the second attempt, set-up attempts are only made by the application software. (The 15-minute timer fires and jobs are printed unless an immediate job was entered.) After two unsuccessful attempts to establish the link, a MINOR alarm is raised. If the System Printer Link is torn down due to an error, System Printer Link Maintenance will raise a MINOR alarm but will not attempt to bring up the System Printer Link.

System Printer Link Maintenance does not cover the elements comprising the SYS-PRNT physical link: the external SYS-PRNT output device, the Data Module (PDM/MPDM/DTDM) and TN754 Digital Line, or the ADU and TN726B Data Line. If System Printer Link Maintenance cannot restore the System Printer Link, the maintenance tests of these individual components of the System Printer Link must be executed to diagnose faults.

Procedures for Restoring the System Printer Link

1. Use **status sp-link** and verify that the `Maintenance Busy` field is `n,` which shows that the System Printer Link is not busied out for maintenance. If the System Printer Link has been busied out, use **release sp-link**. If the link is `down`, proceed to Step 2.
2. Use **display system-parameters features** to determine the location of the System Printer Link.

   Use **status data-module *extension*** and verify that the data extension is in-service/idle. If the data extension is *not* available, refer to the `Port` field. Look for errors and/or alarms on the circuit pack with which this extension is associated. Follow repair instructions for the appropriate MO. Continue with Step 3.

3 Verify the availability of the external SYS-PRNT output device. Make sure that the output device is *on-line* and ready-for-service. Check the physical connectivity between the Data Module and the SYS-PRNT output device.

4 Verify that there is at least one C-LAN port available. The System Printer Link cannot be established without an available C-LAN port. For more information about C-LAN ports, see CLAN-BD (Control LAN Circuit Pack) on page 599.

5 If the problem is not found in the previous steps, check the C-LAN port for problems. For a description of C-LAN boards and connectivity, see CLAN-BD (Control LAN Circuit Pack) on page 599.

When restoring the System Printer link, execute tests on different MOs that comprise the System Printer link. It is recommended that you busyout the System Printer link before trying to restore the link. When the System Printer Link is busied out, every System Printer Link maintenance action is deactivated, and interference with tests of other MOs is prevented.

Error Log Entries and Test to Clear Values

Table 772: SYS-PRNT Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	**test sp-link**
18 (a)	0	**busyout sp-link**	WARNING	OFF	**release sp-link**
257(b)	1, 3 4, 5, 6	Link Retry test (#215)	MINOR[1] WARNING	OFF	**test sp-link l**
513 (c)	0	None	MINOR	OFF	**test sp-link**

1 Minor alarms may be downgraded to Warning alarms based on the value used in the **set options** command.

Notes:

a The System Printer Link has been busied out.

b A failure was encountered while attempting to set up the System Printer Link. This attempt could have been initiated by either Report Scheduler software or by link maintenance during automatic link retry or as a result of a Link Retry test (#215) request. The Aux Data field indicates the following:

1	No C-LAN port available. See CLAN-BD (Control LAN Circuit Pack) on page 599 for explanation.
3, 4	Time-out during setup attempt. Most likely due to problem with physical link or printer status.
5	Internal system error. Most likely temporary/sporadic failure.
2, 6	The data module the printer is trying to use is busy with another call. Use **status data module** to determine when the port is available for testing.

See Procedures for Restoring the System Printer Link on page 1787 for recommended maintenance strategy.

c The SYS-PRNT was interrupted for one of the following reasons:

- The cable to the SYS-PRNT output device is disconnected
- The SYS-PRNT output device is powered off
- The data extension to which the SYS-PRNT output device connects has been busied out
- Internal software error

Check the connectivity of the wires and cables among the wall jacket, data module, and SYS-PRNT output device. Follow the instructions in Procedures for Restoring the System Printer Link on page 1787.

System-Technician-Demanded Tests: Descriptions And Error Codes

When inspecting errors in the system, investigate errors in the order they are presented in the table below.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Link Tear Down test (#213)		X	Destructive
Link Retry test (#215)	X	X	Non-destructive

Link Tear Down Test (#213)

This test is **destructive**.

The Link Tear Down test disconnects the existing link between the media server and the external SYS-PRNT output device. If the link has already been disconnected, this test returns PASS. Every resource allocated for a System Printer Link is released after this test.

Table 773: TEST #213 Link Tear Down Test

Error Code	Test Result	Description / Recommendation
40 50	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to two times.
1010	ABORT	The System Printer Link has been busied out. **1** Use **release sp-link** to release the System Printer Link from the busyout state. **2** Reissue **test sp-link long** to execute the test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to five times.

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Table 773: TEST #213 Link Tear Down Test

Error Code	Test Result	Description / Recommendation
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to two times.
	PASS	The System Printer Link is torn down, or a short test sequence was executed and the link was not torn down.

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Link Retry Test (#215)

This test sends a message to the System Printer management software process instructing it to make a data call to the extension connected to the printer. If the System Printer link is already up, this test passes without making any data call.

Table 774: TEST #215 Link Retry Test

Error Code	Test Result	Description / Recommendation
10, 20	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to two times.
30	ABORT	Internal system error. **1** See "Procedures for Restoring the System Printer Link" on page 1787 for recommended maintenance strategy.
1010	ABORT	The System Printer Link has been busied out. **1** Enter **release sp-link** to release the System Printer Link from the busyout state. **2** Reissue **test sp-link long** to execute the test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to five times.
	FAIL	The System Printer Link CANNOT be established. **1** See "Procedures for Restoring the System Printer Link" on page 1787 for recommended maintenance strategy.
	PASS	The System Printer Link is up.

SYSTEM (System)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
SYSTEM	None	None	System

1 SYSTEM has no associated alarms and thus appears only in the Error Log. There are no tests that run on SYSTEM.

The SYSTEM MO is used to log information about system resets, including interchanges. When software encounters a problem with hardware, or with its own processes, and requests a restart to clear the problem, an error is logged under SYSTEM. For example, if there is a loss of clocking in a system with duplicated servers, the system switches to the other clock and then executes a level-2 system reset to recover from hardware problems caused by the loss of clock. Errors logged under SYSTEM can help to determine the cause of a reset. For more information about interchanges, see:

- S8100 recovery on page 124 in *Maintenance Procedures (555-245-103)*
- Troubleshooting duplicated servers in *Maintenance Procedures (555-245-103)*

The **display initcauses** screen also contains information about the reset.

S8700 / S8500

Error Log Entries and Test to Clear Values

Table 775: System Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
9 (a)	Any	None			
10 (b)	Any	None			
601 (c)	Any	None			
605 (d)	(m)	None			
606 (e)	Any	None			
6001 (f)	Any	None			
6002 (g)(l)	(l)	None			
6003 (h) (l)	(l)	None			

Table 775: System Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
6101 (i)	Any	None			
6102 (j)(l)	(l)	None			
6103 (k)(l)	(l)	None			

2 of 2

Notes:

a Error Type 9: Software requested a System Restart Level 2.

b Error Type 10: Software requested a System Restart Level 1.

c Error Type 601: An error occurred during initialization.

d Error Type 605: A **reset system interchange** or a scheduled server interchange failed. The AUX Data indicates the cause of the failure. Consult the table in note p. Enter the Linux **server** command to determine the current server status, and resolve any problems on the standby server that are preventing the server interchange.

e Error Type 606: A **reset system interchange health-override** failed. The standby server's state of health (SOH) would not allow a spontaneous server interchange. Enter the Linux **server** command to determine the current server status, and resolve any problems on the standby server that are preventing the server interchange.

f Error Type 6001: An operating system error occurred on the active server. The aux data gives the source of the error:

Aux-Data Value	Operating System Error Type
5	Software Abort
6	Server Bus Error

g Error 6002: An application error occurred on the active server. See note (l) to diagnose the error using the aux data.

h Error 6003: An application alarm occurred on the active server. See note (l) to diagnose the error using the aux data.

i Error 6100: An operating system error occurred on the standby server. See error 6001 (g) to interpret the aux data.

j Error 6102: An application error occurred on the standby server. See note (l) to diagnose the error using the aux data.

k Error 6103:An application alarm occurred on the standby server. See note (l) to diagnose the error using the aux data.

l For error types 6002, 6003, 6102, and 6103, the aux-data value points to the MO that the error or alarm is logged against. The following table lists possible aux-data values and their associated MOs. Locate the Error Log entry for the indicated MO and follow the instructions for that error.

AUX Data	Implicated MO
4137	PKT-INT
16384	PROCR
16385	MEM-BD
16389	DUPINT
16391	SW-CTL
16392	H-ADAPTR
16397	R-MEDIA
16398	DISK

m The following table and notes give causes and recommendations for each AUX data value for error 605.

Table 776: SYSTEM Error 605 AUX Data, Failure of Planned Interchange

Aux Data	See Note	Explanation
1352	1	Standby SOH "non-functional"
1353	1	Standby SOH not "functional"
1355	1	Handshake Communication with standby server is down
1356	1	Memory Shadowing not enabled
1357	1	Standby memory not refreshed
1358	2	Mass Storage System was in use
1359	3	PKT-INT link migration failed
1360	1	Interchange failed *
1361	4	SW-CTL failure
1369	7	Could not suspend G3-MT connectivity *
1370	4	Could not freeze active SW-CTL *
1371	5	Internal Error associated with processor interrupts *
1372	6	Minor alarm on standby SYSAM or PKT-INT
1395		Server Duplication not administered
1396	3	PKT-INT Link Migration failure in Begin Step *
1397	3	PKT-INT Link Migration denied, (peer test in progress)
1398	3	PKT-INT Link Migration failure in Completion Step *

1 of 2

Table 776: SYSTEM Error 605 AUX Data, Failure of Planned Interchange

1399	3	PKT-INT Link Migration failure in Finish Step *
1400	4	Could Not Idle SW-CTL dual port RAM *
1401	4	Could Not Refresh SW-CTL dual port RAM *
1402	5	Internal Error (could not get duplication status)
1403	5	Unable to inhibit standby Maintenance Monitor
1404	5	Failure to determine standby server's alarm status
1406	3	Active server's PKT-INT in held-reset state
1418	8	Active Duplication Interface circuit pack is in a bad state and needs to be reset.
2500	5	Internal Software failure (* sometimes)

2 of 2

Notes for SYSTEM Error 605 AUX Data:

1 From the Linux command line, execute **`almdisplay`** and follow the troubleshooting procedures listed there for "media server alarms." After fixing that problem, try the interchange again.

2 Mass Storage System is in use. Check disk for activity. Wait until every MSS activity completes, then retry the interchange again. If the problem persists, check for alarms and errors against MSS components.

3 Test the PKT-INT on both carriers with the long test sequence. Follow procedures for "PKT-INT". Once every test of both PKT-INTs passes, try the interchange again.

4 Consult SW-CTL service documentation. Test SW-CTL on both carriers with the long test sequence. Follow repair instructions for any failures. Once every test of both SW-CTLs passes, try the interchange again.

5 Make sure the standby server is refreshed, then try the interchange again.

6 Examine alarm log to determine which of the PKT-INT or SYSAM circuit packs has a minor alarm against it. Consult the section in this chapter for that circuit pack.

7 Run **test duplication-interface long**, and follow instructions for any test that does not pass.

S8100

Error Log Entries and Test to Clear Values

The Aux Data field may be 0 or the return code from a bad software call, and the following examples in no way exhaust the possibilities. Often, two errors are logged at the same time for each problem.

Table 777: System Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	None
8 (a)	0	None			
9 (b)	Any	None			
10 (c)	Any	None			
21 (d)		None			
355 (e)	Any	None			
356 (f)	Any	None			
601 (g)		None			
602 (h)		None			
603 (i)		None			

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a A System Restart Level 3 was requested.

b A System Restart Level 2 was requested. This can happen due to a loss of tones (due to a faulty Tone-Clock circuit pack).

c A System Restart Level 1 was requested.

d A process trapped.

e A Restart Level 2 occurred due to a power loss.

f A Restart Level 2 occurred due to a tone clock loss.

g An error occurred during initialization.

h An error occurred while loading translations and the system requested a Restart Level 3.

i A process was reset.

TBRI-BD (TN2185 ISDN Trunk-Side BRI)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TBRI-BD	MINOR	**test board *location* long r#**	TBRI-BD

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
G700: The separate, but equivalent, MG-BRI MO can reside in slots 1–4 of a G700 media gateway. Refer to MG-BRI (BRI Trunk Media Module MM720) on page 1249 for information about the MG-BRI MO.

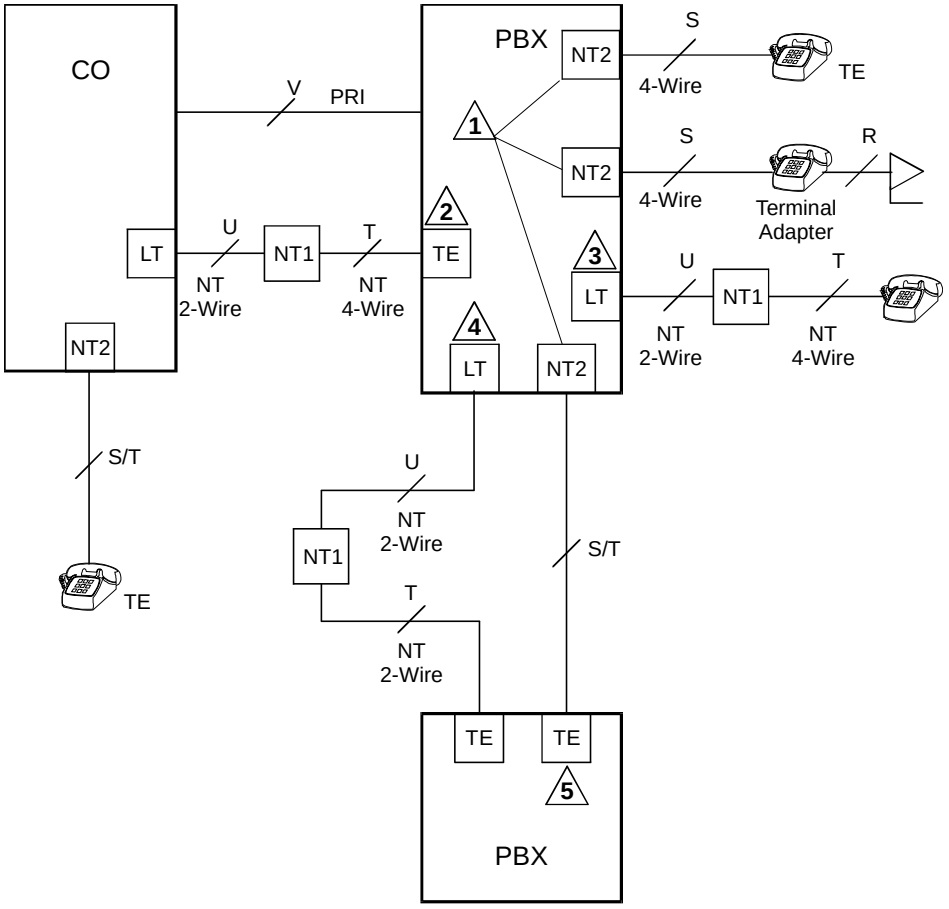
S8100: The TN2185 circuit pack contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64 Kb/s channels (B1 and B2) and over a 16Kb/s signaling (D) channel.

The B1 and B2 channels can be simultaneously circuit-switched or individually packet-switched. Only one channel per trunk can be packet-switched due to PPE (Packet Processing Element) limitations. The D channel is either circuit-switched or packet-switched. Packet switching uses the PPE to combine every D channel into a single physical channel, which is then routed via the concentration highway to the NCE (Network Control Element) and then to the TDM bus. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64-kbps clear data channels. The packet-switched channels support the LAPD protocol and conform with the CCITT Q.920 Recommendations for D-channel signaling.

LEDs

The three LEDs on the circuit pack's faceplate indicate board status. When illuminated, the red LED indicates a board failure or a major or minor on-board alarm, the green LED indicates that testing is in progress, and the amber LED indicates that the board is in use.

Figure 141: Integrated Trunk-Side BRI, ISDN Interface Reference Points



ISDN Interface Reference Points cydfisdn RPY 072397

ISDN Interface Reference Point definitions:

LT	Logical Terminal
V	Primary Rate user/network (asymmetrical) trunk interface. The ECS is capable of acting as the user or as the network side of this 1.544- or 2.048-Mbps interface.
R	Interface between Terminal Equipment and Network Termination
S	Basic Rate network-side 4-wire line interface
S/T	4-wire Basic Rate connection to a Network Termination[1].
T	4-wire Basic Rate interface to a Network Termination.[2]
TE	Terminal Equipment
U	Basic Rate network-side 2-wire line interface.
1	TN556B ISDN-BRI 4-Wire S/T-NT Line (A-law)
2	TN2185 ISDN-BRI 4-Wire S Interface (Trunk Side)
3	TN2198 ISDN-BRI 2-Wire U Interface
4	TN2198 ISDN-BRI 2-Wire U Interface
5	TN2185 ISDN-BRI 4-Wire S Interface (Trunk Side)

1 Network Termination 2 (NT2), that terminates Layer 1 and higher layers. PBXs, LANs, and terminal controllers typically provide NT2 functionality including protocol handling and multiplexing for Layers 2 and 3.

2 Network Termination 1 (NT1), that terminates Layer 1 and monitors maintenance, performance, timing, power transfer, multiplexing, and multidrop termination with contention resolution.

Hardware Error Log Entries and Test to Clear Values

Table 778: TBRI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **sh r 1**
1 (a)	Any	None	MINOR	ON	
257 (b)	65535	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **r 20**
513 (c)	4352 to 4357		None	ON	
769 (d)	4358				
1025 (e)		NPE/NCE Audit test (#50)	None	ON	
1291 (f)	4359	Clear Error Counters (#270)	MINOR	ON	
1294 (g)	46088 to 46096	SAKI Sanity test (#53)	MINOR	ON	See (h)

1 of 2

Table 778: TBRI-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1537 (h)	46082		MINOR	ON	
1793 (i)	46080		MINOR	ON	
1794 (i)	46094		MINOR	ON	
1795 (i)	46085		MINOR	ON	
2305 (j)	46104		None	ON	
2306 (j)	46081		None	ON	
3330 (j)	46083		MINOR	OFF	
3586 (k)			MINOR	OFF	
3840 (l)	4096 to 4101				
3842 (m)	46095				
3843 (n)	46097				

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Notes:

a The circuit pack stopped functioning or is physically removed from the system.

> **NOTE:**
> This alarm logs approximately 11 minutes after removing the circuit pack and/or the SAKI Sanity test (#53) fails.

If the circuit pack is not in the system, insert a circuit pack in the same slot as the error indicates. See note (g).

b Transient communication problems between the switch and this circuit pack. Execute **test board *UUCSS*** and refer to the repair procedures for the Control Channel Loop-Around Test (#52) on page 2064.

c On-board hardware failure. Aux data values correspond to the following detected errors:

4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4357	Instruction set error

Use **busyout board *UUCSS*** and **reset board *UUCSS*** to reset the circuit pack. When reset, the circuit pack executes a set of tests to detect the presence of any of the faults listed above. Detection of one of these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedure in Note (a).

d The circuit pack detects a program logic error. While no action is required, this error can lead to other errors against this circuit pack.

e The circuit pack cannot update and read back NPE/NCE memory. This error can be ignored, but may lead to other errors against this circuit pack.

f The TN2185 board notifies maintenance software that it has detected a parity error while accessing its dynamic RAM (that stores the board's translation information and downloadable application firmware). Maintenance software resets the circuit pack.

g Unable to write LAN Translation RAM Error (internal memory access error). Translation RAM locations for the call connection attempt are not available, and one or more RAM locations are bad due to a translation RAM read-back error. Reset the circuit pack with **busyout board *UUCSS*** and **reset board *UUCSS***. If the Circuit Pack Restart test (#594) passes, then the on-board circuitry is healthy. Retire the alarm with **test board *UUCSS* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

h Frame overrun at Packet bus interface. Due to an on-board fault or to faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack is alarmed, refer to the repair procedures for those MOs. If this error persists, maintenance software removes the board from service; replace the circuit pack.

i The circuit pack is has problems transmitting/receiving data to/from the Packet bus.

1793	Parity errors are detected when transmitting data to the Packet bus.
1794	Packet bus transmit buffers overflow.
1795	Circuit pack cannot find end of frame when transmitting to Packet bus. Clear the alarm with **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long clear**, **release board *UUCSS***. If the error recurs within 10 minutes, replace the circuit pack.
2306	Error in a received frame from the Packet bus, most likely caused by a packet bus problem, but may be due to a circuit pack fault. An invalid Link Access Procedure Data (LAPD) frame error occurs if the frame contains a bad Cyclical Redundancy Check (CRC). If bus parity errors occur, run the LAN Receive Parity Error Counter test (#595) to determine whether the condition has cleared. Refer to the maintenance documentation to determine whether the problem is isolated to this circuit pack or is caused by Packet bus faults.

j Error Type (2305, 3330): A critical failure in the Circuit Pack's Packet bus interface. Possible causes include either a Packet bus fault or an on-board fault, for example, the board received a bad CRC or invalid DLCI. If the Packet bus is alarmed, see Isolating and repairing packet-bus faults (or S8100 packet bus fault isolation and repair for **S8100**) in *Maintenance Procedures (555-245-103)*. The number of ISDN circuit packs displaying this error increases the probability of errors due to Packet bus problems.

If there are no Packet bus alarms, reset the circuit pack with **busyout board *UUCSS*** and **reset board *UUCSS***. If the Circuit Pack Restart test (#594) passes, then the on-board circuitry is healthy. Retire the alarm with **test board *UUCSS* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

k The server's software detects an excessive number of up-link messages from the TN2185 board within a certain time period. To prevent the faulty board from flooding the switch with data, the switch software takes the board out of service and alarms it. The switch software also tells the Archangel to ignore up-link messages from the board.

When the board is alarmed due to this error, the switch software periodically puts the board back in service and tells the Archangel to process up-link messages from the board. If the problem still exists, the software takes the circuit pack out of service again. If the circuit pack does not exhibit the problem for a certain time period, then maintenance software resolves the alarm and the circuit pack is left in service.

l The circuit pack received an inconsistent down-link message (a bad header, port number, data, subqualifier, or logical link) over the Control Channel.

m The board is receiving data from the bus faster than it can distribute the data to its endpoints, causing the FIFO RAM buffer to overflow. This error can occur occasionally due to the statistical sizing of the buffers. If it occurs frequently, it may indicate a LAPD parameter mismatch. LAPD should recover from this problem, but it may degrade the performance of the LAN bus.

When this error is reported, maintenance reads and clears the board counter and logs the problem in the maintenance error log.

n Bad translation RAM detected, but the call continues by using another translation location. The circuit pack reports this error when it cannot update NPE/NCE memory and read it back. This error is not service-affecting and can be ignored, but can lead to other types of errors against this circuit pack.

System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system, always investigate tests in the order listed below. By clearing error codes associated with the *Control Channel Loop-around* test (#52), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-around test (#52)	X	X	ND
NPE/NCE Audit test (#50)		X	ND
LAN Receive Parity Error Counter test (#595)		X	ND

1 D = Destructive; ND = Nondestructive

Control Channel Loop-Around Test (#52)

See the repair procedure described in ‘‘XXX-BD (Common Port Circuit Pack/Media Module)’’ on page 2086.

NPE /NCE Audit Test (#50)

See the repair procedure described in ‘‘XXX-BD (Common Port Circuit Pack/Media Module)’’ on page 2086.

SAKI Sanity Test (#53)

This test is **destructive**.

See the repair procedure described in "XXX-BD (Common Port Circuit Pack/Media Module)" on page 2086. This test is only run as a part of a reset board procedure.

LAN Receive Parity Error Counter Test (#595)

This test is nondestructive. The test reads and clears the circuit pack's LAN Receive Parity Error Counter. This counter increments when it detects a parity error from the Packet bus. These errors may indicate problems with a circuit pack, Packet bus, or with another circuit pack on the bus. Use this test to verify the repair.

Table 779: Test #595 LAN Receive Parity Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack with **busyout board *UUCSS*** and **reset board *UUCSS***. **2** If the test aborts again, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1–10	FAIL	The circuit pack is still detecting errors of this type. The error code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, verify the validity of the Packet bus. Run the Packet bus maintenance test with **test pkt *P* long**. If any Packet bus tests fail, see PKT-BUS (Packet Bus) on page 1406 for recommended repair procedures. **3** If the Packet bus test passes, check the validity of the circuit pack. Execute a test that involves data transmission onto the Packet bus. For example, **test port *UUCSSpp*** may use the connectivity tests of the BRI-PORT MO. If the test fails, refer to the repair procedures; otherwise, proceed to the next step. **4** Other circuit packs on the Packet bus may be causing of the parity error. Use **display errors** to check the Error Log for alarmed other circuit packs. Resolve any alarms for other circuit packs as well. Rerun the LAN Receive Parity Error Counter test (#595).
	PASS	No errors detected.

TBRI-PT (ISDN Trunk-Side BRI Port)

S8700 / S8500 / S8100 S8300

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TBRI-PT	MAJOR	**test port *location* l r#**	TBRI-PT
TBRI-PT	MINOR	**test port *location* l r#**	TBRI-PT
TBRI-PT	WARNING	**test port *location* sh r#**	TBRI-PT

1 For information on specifying a ***location***, see Command Syntax on page 179.

This document describes the port maintenance features of the TN2185 Trunk-Side ISDN-BRI board. The circuit pack provides 8 S/T ISDN 2B+D ports that interface to either the central office or another PBX.

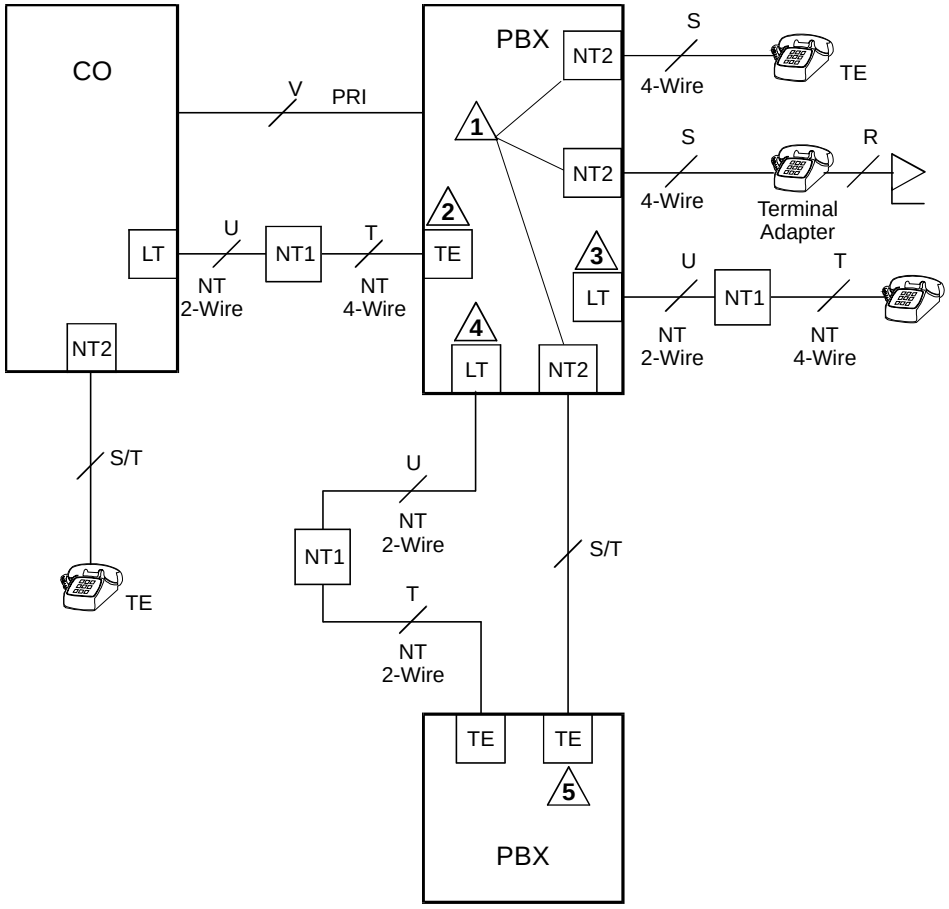
The TN2185 circuit pack contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64-kbps channels (B1 and B2) and over a 16-kbps signaling (D) channel. The B1 and B2 channels can be simultaneously circuit-switched, or individually packet-switched. Only one channel per trunk can be packet-switched due to PPE (Packet Processing Element) limitations. The D channel is either circuit- or packet-switched. Packet switching uses the PPE to combine every D channel into a single physical channel, which is then routed via the concentration highway to the NCE (Network Control Element) and then to the TDM bus. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64-kbps clear data channels. The packet-switched channels support the LAPD protocol and conform with the CCITT Q.920 Recommendations for D-channel signaling.

NOTE:
S8300 / **G700**: Although the TBRI-PT MO is provided for a G700 media gateway, this MO only partially supports the G700's MM720 BRI media module.

LEDs

The three LEDs on the circuit pack's faceplate indicate a board's status. When illuminated, the red LED indicates a board's failure or a major or minor on-board alarm. The green LED indicates that testing is in progress. The amber LED indicates that the board is in use.

Figure 142: Integrated Trunk-Side BRI, ISDN Interface Reference points



ISDN Interface Reference Points cydfisdn RPY 072397

ISDN Interface Reference Point definitions:

LT	Logical Terminal
V	Primary Rate user/network (asymmetrical) trunk interface. The ECS is capable of acting as the user or as the network side of this 1.544- or 2.048-Mbps interface.
R	Interface between Terminal Equipment and Network Termination
S	Basic Rate network-side 4-wire line interface
S/T	4-wire Basic Rate connection to a Network Termination[1].
T	4-wire Basic Rate interface to a Network Termination.[2]
TE	Terminal Equipment
U	Basic Rate network-side 2-wire line interface.
1	TN556B ISDN-BRI 4-Wire S/T-NT Line (A-law)
2	TN2185 ISDN-BRI 4-Wire S Interface (Trunk Side)

3 TN2198 ISDN-BRI 2-Wire U Interface

4 TN2198 ISDN-BRI 2-Wire U Interface

5 TN2185 ISDN-BRI 4-Wire S Interface (Trunk Side)

1 Network Termination 2 (NT2), that terminates Layer 1 and higher layers. PBXs, LANs, and terminal controllers typically provide NT2 functionality including protocol handling and multiplexing for Layers 2 and 3.

2 Network Termination 1 (NT1), that terminates Layer 1 and monitors maintenance, performance, timing, power transfer, multiplexing, and multi-drop termination with contention resolution.

Hardware Error Log Entries and Test to Clear Values

Table 780: TBRI-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test Port** *UCSSPP* **sh r 1**
1 (a)		Level 1 Status test (#1242)	MINOR	OFF	
129[2]					
257(b)					
513 (c)	46222	XMIT FIFO Overflow	MINOR	ON	
514 (d)		XMIT FIFO Overflow (TDM)	MINOR	ON	
769 (e)		Traffic Hyperactivity	MINOR	OFF	
1025 (f)					
1281 (g)		NPE Crosstalk test (#617)	MINOR	ON	
1537 (h)	46210	CRC error (D-channel)	MINOR	OFF	
1538 (i)		CRC error (TDM D-channel)	MINOR	OFF	
1793 (j)		BRI Port Local TDM Loop-around test (#619)	MINOR	ON	
2049 (k)			MINOR	OFF	
2305 (l)		Layer 3 Query (#1243)	MINOR	OFF	
3073 (m)		Slip Query test (#1244)	MINOR	OFF	

Table 780: TBRI-PT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3585 (n)		Receive FIFO Overflow (TDM D-channel)	Log Only	ON	
3586 (o)					
3587 (p)					
3588 (q)	46223				
3589 (r)					
3590 (s)	46211				
S8700					
3591 (t)					
3592 ()					
3841 to 3942 (u)					
S8100					
3591 (s)					
3592 (t)					
3841 to 3942 (u)					

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 The far-end switch changed the ISDN service state. This may be a temporary condition.

Error Notes:

a Loss of continuity of Layer 1 to the far end. It is assumed that Layer 1 remains active, even when both B channels are idle.

This test determines whether Layer 1 is active or not. If Layer 1 is not active, the test attempts to activate it. If Layer 1 cannot be activated, the port is taken out of service, and the test fails.

b The D channel failed at Layer 2. Expiration of this timer indicates that attempts to bring the failed link back into service have not succeeded and some recovery actions should be taken on the associated B channels. Upon expiration, associated in-service B channels are put in the out-of-service/far-end state.

c Error Type (513) — On-board hardware failure. The FIFO RAM buffers have overflowed, indicating a hardware problem.

d Error Type (514) — Transmit FIFO Overflow - This error indicates that the circuit pack is having problems transmitting data to the TDM D channel. This error only occurs only a system that switches the packet implementation of the D channel over the TDM bus. This error indicates an on-board problem related to the packet implementation of the D channel (R6.2 and higher).

e Error Type (769) — The port is generating too many uplinks. The link is being suspended.

f Error Type (1025) — An expired timer has created an unexpected event. The timer could be any of the following:

Timer	Event
T3031	ISDN T3031 timeout
T3032	ISDN T3032 timeout
T305	ISDN T305 timeout
T3081	ISDN T3081 timeout
T3082	ISDN T3082 timeout
TL3	Status Inquiry
T304	Setup ACK
T310	Call Proceeding Receive
T313	Connect SEND

g Error Type (1281) — This error occurs when the NPE Crosstalk test (#617) has failed. The test will be repeated every 15 minutes until it passes. Follow normal trouble shooting procedures for NPE Crosstalk test (#617). If this does not fix the problem, follow normal escalation procedures.

h Error Type (1537) — The board received a bad Cyclical Redundancy Check (CRC) over the D channel. This error is reported on a per-port basis. When the CRC errors exceed 5 within 15 minutes, the port is taken out of service for 5 seconds. If 5 more CRC errors are received within 15 minutes of the first set of 5 errors, the port is taken out of service for 1 minute. If 5 more CRC errors are received within 15 minutes of the previous 5, the port is taken out of service for 15 minutes.

This error is most likely due to a problem with backplane wiring, a noise source, or no termination (an open circuit). It usually does not indicate a problem with the circuit pack.

1 Check the backplane wiring.

2 If the problem persists escalate the problem.

i Error Type (1538) — This error occurs when a frame with a bad CRC is received by the BRI trunk board. This error only occurs on a system that switches the packet implementation of the D channel over the TDM bus. This error indicates an off-board problem related to the packet implementation of the TDM D channel (R6.2 and later).

j Error Type (1793) — The BRI Port Local TDM Loop Around test (#619) failed. Run the long test sequence, and pay particular attention to the results of the BRI TDM Port Loop test (#619).

k Error Type (2049) — The Layer 2 Link Query failed. The test is repeated every 15 minutes until it passes.

l Error Type (2305) — The Remote Layer 3 Query failed. The test is repeated every 15 minutes until it passes.

m Error Type (3073) — A frame of information had to be repeated or deleted. Slips usually occur when the received bit rate is not synchronized with the TDM bus clock.

n Error Type (3585) — The circuit pack detected an overflow of its receive buffers. This error occurs only a system that switches the packet implementation of the D channel over the TDM bus. This error indicates an on-board problem related to the packet implementation of the TDM D channel (R6.2 and higher).

o Error Type (3586) — Each port can support up to three Terminal Endpoint Identifiers (TEIs). Each channel on the port can request a TEI assignment from the switch if it supports ISDN-BRI TEI assignment procedures. If switch services gets a request for a fourth TEI on a port, it reports this event to maintenance software and initiates TEI check procedures on the port. Check to see if the correct number of channels are administered for this port.

The user side supports automatic TEI assignment by the network. Both fixed and automatic TEI assignment are supported on the network side.

p Error Type (3587) — Service Profiler IDentifier (SPID) value is invalid or is a duplicate of another SPID that is already initialized at Layer 3 on the port. SPIDs are not used on the TN2185 circuit pack. However there will be related events.

q Error Type (3588) — The board receives D-channel data from the bus faster than it can process the data. The FIFO RAM buffers overflowed. This error occurs occasionally due to the statistical sizing of the buffers; however, frequent occurrences may indicate a LAPD parameter mismatch between the two endpoints of a packet-switched connection. Run the long test sequence, and pay particular attention to the results of the Receive FIFO Overflow test (#625).

r Error Type (3589) — The BRI Port Local LAN Loop Around test (#618) failed. Run the long test sequence, and pay particular attention to the results of Test #618.

s Error Type (3590) — An activated BRI port receives a frame containing a DLCI over a D channel for which it does not have a translation. This error normally indicates an off-board problem related to a state mismatch between the far end and the switch. This error is logged only.

t Error Type (3591) — The port is generating too many uplinks and is taken out of service.

u Error Types (3841–3942) — Table 781, Cause Values for Error 3841–3942, on page 1808 contains the received ISDN cause values for Errors 3841–3942 that are recorded in the hardware error logs. Unless otherwise stated, the cause values are D-channel events. The aux data field shows which port caused the error.

Table 781: Cause Values for Error 3841–3942

Value	Type of Problem	Meaning
2	admin	No route to specific transit network
3	admin	No route to destination (or Germany bcap not imp)
6	admin	Channel unacceptable
18	switch problems	No user responding
38	switch problems	Network failure
50	subscription	Requested facility not subscribed
52	admin	Outgoing calls barred
54	admin	Incoming calls barred
62	subscription	Service not authorized
63	admin/sub	Service/option not available
65	admin/sub	Bearer capability not implemented
66	admin/sub	Channel type not implemented

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Table 781: Cause Values for Error 3841–3942

Value	Type of Problem	Meaning
69	admin/sub	Requested facility not implemented
70	admin/sub	Only restricted digital BC available
79	admin	Service/option not implemented
88	admin	Incompatible destination
102	switch problems	Recovery on timer expired

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System Technician-Demanded Tests: Descriptions and Error Codes

When inspecting errors in the system, investigate tests in the order listed below. By clearing error codes associated with the *BRI Local LAN Port Loop Around* test (#618), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
BRI Local LAN Port Loop Around test (#618) **S8300** / **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	D **S8100**: ND
BRI TDM Port Loop Around test (#619) **S8300** / **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	D
L1 State Query test (#1242) **S8300** / **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.	X	X	D
CRC Error Counter test (#623)		X	ND
Receive FIFO Overflow test (#625)		X	ND
Layer 3 Query test (#1243)		X	ND
Slip Query test (#1244)	X	X	ND
Clear Error Counters test (#270)	X	X	ND
NPE Crosstalk test (#617) **S8300** / **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	D

1 D = Destructive; ND = Nondestructive

Clear Error Counters Test (#270)

This test is **non**destructive.

This test clears the error counters associated with each TBRI-PT. This test passes if maintenance software is able to successfully send the downlink messages. The test aborts otherwise.

Table 782: Test #270 Clear Error Counters

Error Code	Test Result	Description / Recommendation
Any	ABORT	Maintenance could not send the downlink message.
	PASS	The message to clear the error counters of the TBRI-PT MO has been sent.

NPE Crosstalk Test (#617)

This test is **conditionally destructive**.

One or more NPEs reside on each circuit pack with a TDM-bus interface. The NPE controls port connectivity and gain and provides conferencing functions on a per-port basis. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of a port's long test sequence and takes approximately 20 to 30 seconds to complete. Crosstalk testing is performed on both B channels (B1 and B2) associated with a BRI port. If this test fails on either channel, any channel connected to the port is taken out-of-service. This test aborts if the port and its associated channels are not in the idle state.

NOTE:
S8300 / **G700**: This test does not execute on a G700 Media Gateway.

Table 783: Test #617 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the station extension or trunk group/member number of the port. Use **status bri-port *UUCSSpp*** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status bri-port** to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	This test is not valid for this type of translation. Ports administered as "ASAI" or "ADJK" cannot run this test, because the B channels associated with the port are not used by ASAI or Avaya Adjunct Links. This is a normal condition.

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Table 783: Test #617 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
S8300 / G700: 1412	ABORT	This test does not execute on a G700 media gateway.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The NPE of the tested port was found to be transmitting in error, causing noisy and unreliable connections. Error code 1 indicates that the NPE Crosstalk test failed on Channel B1. Error code 2 indicates that the NPE Crosstalk test failed on Channel B2. **1** Replace circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times to ensure it continues to pass. **2** If complaints still exist, examine the connections and wiring.

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BRI Port Local LAN Loop-Around Test (#618)

This test is **destructive**.

> **NOTE:**
> S8300 / G700: This test does not execute on a G700 Media Gateway.

This test checks the connectivity of the BRI port across the LAN bus. Because this test is destructive, run this test only if the port is out-of-service.

Failures of this test indicate either on-board faults associated with the TBRI-PT hardware on the circuit pack or problems with the LAN Bus, which is used to form connectivity between the switch and the TBRI-PT.

If the port is in a state other than out-of-service, the BRI Port Local LAN Loop-Around test will abort. If the port is out-of-service, then the port is put into a local loop-around mode and the following test is executed.

A loop-around test is performed across the Packet bus for the D channel. The switch sends data over a packet connection, which is looped back by the BRI port (D channel) and received back by the switch. The test passes if the packet connection can be established and the transmitted data is received unaltered. The test aborts if the Packet bus is alarmed in the Processor Port Network (or the port network where that circuit pack resides) or if the Packet Interface board is out-of-service. The test fails due to either on-board faults associated with the BRI port hardware on the circuit pack or problems with the LAN bus.

Table 784: Test #618 BRI Port Local LAN Loop Around

Error Code	Test Result	Description / Recommendation
1015	ABORT	The port is not out-of-service. **1** Use **status bri-port *UUCSSpp*** to determine the status of the port. **2** If it is in use, wait until it is idle, and then use **busyout port *UUCSSpp*** to place it in the out-of-service state and repeat this test. **CAUTION:** Since the busyout command is destructive, execution of this command prior to the port being idle causes every call associated with the BRI port to be torn down.
1139	ABORT	The Packet bus in the port network is out-of-service. **1** Follow the repair procedures for the Packet bus. **2** Run **test port *UUCSSpp* long** and verify the repair by viewing the results of the BRI Port Local LAN Loop-Around test (#618).
1141	ABORT	The PKT-CTRL (**S8100**: PKT-INT) is out-of-service. **1** Follow the repair procedures for the PKT-CTRL (**S8100**: PKT-INT). **2** Run **test port *UUCSSpp* long** and verify the repair by viewing the results of the BRI Port Local LAN Loop-Around test (#618).
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2012 2100	ABORT	Internal system error Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The Loop-Around test has failed. **1** If the test fails repeatedly, try to reset the circuit pack with **busyout board *UUCSS*** and **reset board *UUCSS*** if the other ports on the board are idle. **2** If the test fails again, execute **test pkt *P***. If this fails, follow failure procedures in the PKT-BUS section. **3** If the tests in Step 2 pass, the problem is local to the BRI board. Replace the trunk circuit pack.
	PASS	The BRI Port Local LAN Loop-Around test passed.

BRI Port Local TDM Loop-Around Test (#619)

This test is **conditionally destructive**.

NOTE:
S8300 / **G700**: This test does not execute on a G700 Media Gateway.

This test verifies the connectivity of a BRI port across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack.

This Loop-Around test runs the following individual tests on the two B channels (B1 and B2) associated with the port:

- A Loop-Around test across the TDM bus for B1.
- A Conference Circuit test for B1.
- A Loop-around test across the TDM bus for B2.
- A Conference Circuit test for B2.

The tests are run in the above order. If one fails, the remaining tests in the sequence are not executed, and maintenance software returns an error code.

Table 785: Test #619 BRI Port Local TDM Loop Around

Error Code	Test Result	Description / Recommendation
1000	ABORT	The system resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status bri-port *UUCSSpp*** to determine the service state of the port. If the service state indicates that the port is in use, the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.

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Table 785: Test #619 BRI Port Local TDM Loop Around

Error Code	Test Result	Description / Recommendation
1004	ABORT	The port has been seized by a user for a valid call. Use **status trunk** for the trunks associated with this port and determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort and the port is idle, escalate the problem.
1005	ABORT	This test is not valid for this type of translation. Ports administered as **ASAI** or **ADJK** cannot run this test because the B channels associated with the port are not used by ASAI or Avaya Adjunct Links. This is a normal condition.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test was not received from the BRI-LINE circuit pack within the allowable time period. **1** If this result occurs repeatedly, try to reset the circuit pack with **busyout board *UUCSS*** and **reset board *UUCSS*** if other ports on the board are idle. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times.
1, 2	FAIL	The TDM Looparound failed on one of the channels. • Error Code 1 — TDM Loop Around test failed on B1. • Error Code 2 — TDM Loop Around test failed on B2.
7, 8	FAIL	The Conference Circuit tests failed on a B channel. • Error Code 7 — test failed on B1 • Error Code 8 — test failed on B2. **1** If the test fails repeatedly, try to reset the circuit pack with **busyout board *UUCSS***, **reset board *UUCSS***, and then**release board *UUCSS*** if other ports on the board are idle. **2** If the test fails again, replace the circuit pack.
	PASS	The BRI Port Local TDM Loop Around test passed.

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CRC Error Counter Test (#623)

This test is **non**destructive.

This test reads the BRI port's CRC error counters that are maintained on the BRI circuit pack. The Cyclic Redundancy Check (CRC) is a means of error detection used to determine the integrity of data frame contents. The CRC error counter is incremented by the circuit pack when it detects a CRC error. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is non-zero, the test fails, and the value of the counter is displayed in the `Error Code` field.

Table 786: Test #623 CRC Error Counter Test

Error Code	Test Result	Description / Recommendation
ANY	FAIL	This error occurs when a frame with a bad CRC is received over the D channel by the BRI board. This error is reported on a per-port basis when the counter goes over the threshold. This error is most likely due to a problem with the wiring or interference on the wiring caused by a noise source or no termination. It usually does not indicate a problem with the circuit pack.
	PASS	The CRC error counter was read correctly and has a value of 0.

Receive FIFO Overflow Error Counter Test (#625)

This test is **non**destructive.

This test reads and clears the BRI port's Receive FIFO Overflow error counter maintained on the TBRI-BD circuit pack. This counter is incremented by the circuit pack when it detects an overflow of its receive buffers. The test passes if the value of the counter is 0 (that is, the error is cleared). If the counter is non-zero, the test fails, and the value of the counter is displayed in the Error Code field. This error can occur either if:

- Signaling frames are being received from the Packet bus at a rate sufficient to overflow the receive buffers on the circuit pack for a port
- A hardware fault is causing the receive buffers not to be emptied properly by the circuit pack.

This test is useful for verifying the repair of the problem.

Table 787: Test #625 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack with **busyout board *UUCSS*** and **reset board *UUCSS***. **2** If the test aborts again, replace the circuit pack.

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Table 787: Test #625 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
value	FAIL	The TBRI-BD circuit pack is still detecting errors of this type. The Error Code field contains the value of this counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, run the long test sequence, and pay particular attention to the Loop-Around tests (#618 and #619). See the repair procedures for the executed test if it fails. Otherwise, go to the next step. **3** Replace the circuit pack.
	PASS	The Receive FIFO Overflow error counter was read correctly and has a value of 0.

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Level 1 Status Inquiry Test (#1242)

This test is **non**destructive.

NOTE:
S8300 / **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.

This test determines the state of the transmission facility of a BRI port at the Level 1 (L1) physical layer: Activated, Pending Activation, or Deactivated.

The Activated state is the correct state for an ISDN-BRI port. In this state the L1 interface can send and receive synchronized signals. This test passes if the state of L1 is Activated. This test also passes if software has taken this port out of service. See the description of the L1 “Deactivated State” below for more details.

The Pending Activation state indicates a problem with the channels, the wiring, or the TBRI-BD circuit pack. When in this state, the Level 1 interface is either not receiving any L1 framing from the channel, or it is communicating with the channel but cannot transition to the Activated state.

The Deactivated state indicates a problem with the TBRI-BD circuit pack. When in this state, the Level 1 interface is not active, and an idle signal is transmitted to the channels or that Layer 1 was deactivated by the switch. When an TBRI-PT port is placed in the out-of-service state, Level 1 is also put into the Deactivated state. This could be due either to the system detecting a fault with the port or to a **busyout port UUCSSpp** request.

Table 788: Test #1242 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
1187	ABORT	The board or port may be busied out. **1** Look in the Error Log for Error Type 18 (port busied out) for this port and TBRI-BD (board busied out). If this error type is present for TBRI-PT only, then release the port with **release port *pp*** and run the test again. If the error is present for both TBRI-BD and TBRI-PT, then release the board with **release board *UUCSS*** and run the test again. When you release a board, you release every port associated with it. If certain ports still need to be busied out, use **busyout port *UUCSSpp*** to busy them out. **2** Make sure the endpoint is connected. **3** Retry the command at 1-minute intervals up to 5 times.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2000	ABORT	Response to the test was not received from the circuit pack within the allowable time period. **1** If the test aborts repeatedly up to 5 times, reset the circuit pack with **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **2** If the test aborts again, replace the circuit pack.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	Received a status of Level 1 Pending Activation. U interface down indicating a problem with a connection between the switch and the NT1, a 2- to 4-wire converter that is used to connect 4-wire terminals to a 2-wire TN2198 or TN2185 circuit pack. **1** Verify that the connections between the switch and the NT1 are good. Verify that the NT1 has power. **2** Execute **test port *UUCSSpp*** and review the results of the Level 1 Status Inquiry test to verify the repair. If this test still fails, proceed to Step 3. **3** Follow the manufacturers repair procedures for the NT1. Then execute **test port *UUCSSpp*** and review the results of the Level 1 Status Inquiry test to verify repair.

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Table 788: Test #1242 Level 1 Status Inquiry

Error Code	Test Result	Description / Recommendation
2	FAIL	Received a status of Level 1 Pending Activation. U interface up, S/T interface down, which indicates a problem with the NT1 or the wiring between the NT1 and the BRI endpoint (S/T interface). **1** Execute **test port *UUCSSpp*** and review the results of the Level 1 Status Inquiry test to verify the repair. If this test still fails, proceed to Step 2. **2** Follow the manufacturer-recommended repair procedures for the NT1. Then execute **test port *UUCSSpp*** and review the results of the Level 1 Status Inquiry test to verify repair.
3	FAIL	Received a status of Level 1 Deactivated; the port is out-of-service. **1** Issue **status bri-port *UUCSSpp*** to verify that the service state of the port is out-of-service. If the service state of the port is not out-of-service, escalate the problem to the next tier. Otherwise, proceed to Step 2. **2** If the port has been placed out-of-service with **busyout port *UUCSSpp***, try releasing the port by executing **release port *UUCSSpp***. Then issue **test port *UUCSSpp* long** and review the results of Level 1 Status Inquiry test. If this test still fails, proceed to Step 3. **3** After executing **test port *UUCSSpp* long**, review the results of every test. Follow the repair procedures for any tests that fail. Verify repair of the problem by executing **test port *UUCSSpp*** and by determining that the Level 1 Status test passes. If the test continues to fail for this reason, escalate the problem to the next tier.
4	FAIL	Received a status of Level 1 Pending Activation, the NT1 has a loss of power indicating a problem with the NT1. **1** Follow the manufacturer-recommended repair procedures for the NT1. **2** Execute **test port *UUCSSpp*** and review the results of the Level 1 Status Inquiry test to verify the repair.
	PASS	This test indicates that Level 1 is activated or that software has taken the port out of service.

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Layer 3 Query Test (#1243)

This test is **non**destructive.

This test is used to check the application layer communications across the in-service ISDN D channel. The test passes if a status enquiry message is successfully sent, fails if the signaling link is down, and aborts if a query is already running or there is an internal error.

Table 789: Test #1243 Layer 3 Query

Error Code	Test Result	Description / Recommendation
1005	ABORT	The test aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, a modem pool member or Music on Hold). This error can be ignored.
1019	ABORT	Test is already running.
1113	ABORT	The signaling link is down. **1** Use **test port *UUCSSpp* long** to clear any errors which prevent establishment of the signaling link. **2** Examine the results of Test #626, which is executed with the command. If this test aborts or fails, follow the repair procedure for the Signaling Link Status test. **3** Escalate problem if BRI Layer 3 Query test continues to abort.
1139	ABORT	The Packet bus in the port network is out-of-service. **1** Follow the repair procedures for the Packet bus. **2** After completing step 1, execute **test port *UUCSSpp* long** and review the results of the BRI Port Local LAN Loop-around test to verify the repair.
1141	ABORT	The PKT-CTRL (**S8100**: PKT-INT) is out-of-service. **1** Consult the repair procedure for PKT-CTRL (**S8100**: PKT-INT). **2** If Step 1 does not resolve the problem, escalate to the next tier.
1187	ABORT	The circuit pack or port may have been busied out by a technician. **1** Look in the Error Log for Error Type 18 (busied out) for TBRI-BD or TBRI-PT. **a** If this error type is present for TBRI-PT, then release the port with **release port *UUCSSpp*** and run the test again. **b** If the error is present for both TBRI-BD and TBRI-PT, then release the circuit pack with **release board *PUUCSS*** and run the test again. When you release the circuit pack, you release every port associated with it. If certain ports still need to be busied out, use **busyout port *UUCSSpp*** to busy them out. **2** Make sure the terminal is connected. **3** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The switch has successfully sent a Status Enquiry message.

Slip Query Test (#1244)

This test is **non**destructive.

Slips occur when the transmitter and receiver are not running at precisely the same clock rate. The Slip Alarm Inquiry test polls the total number of slips that have occurred on a link.

When the TN2185 circuit pack detects a slip condition, maintenance software initiates the Slip Alarm Inquiry test to query the slip counters on the TN2185 circuit pack and total the slip counts in the maintenance software.

If the slip count is over the threshold, a Minor alarm is raised against the TN2185 circuit pack, leaving every port of the TN2185 circuit pack in the in-service state. If the TN2185 circuit pack is used to supply the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See "TDM-BUS (TDM Bus)" and SYNC (Port-Network Synchronization) on page 1751 for additional information.

Table 790: Test #1244 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this error type.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1 to 88	FAIL	The circuit pack and the remote endpoint are not synchronized to the same clock rate, which has generated the Slip alarm. The error code equals the number of slips detected by the TN2185 circuit pack since the last Slip Alarm Inquiry test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the circuit pack is a TN2185, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **4** Check the physical connections of DS1 Interface circuit packs and cable. **5** Replace the local DS1 Interface circuit pack and repeat the test. **6** Contact T1 Network Service to diagnose the remote DS1 endpoint.
	PASS	No Slip alarm is detected on the DS1 Interface circuit pack.
0	NO BOARD	The DS1 Interface circuit pack is not administered. **1** Use **add ds1 *UUCSS*** to administer the DS1 Interface circuit pack. **2** Run the test again. **3** If the test continues to return NO BOARD, escalate the problem.

TBRI-TRK (Trunk-Side ISDN BRI)

S8700 / S8500 / S8100 / S8300

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TBRI-TRK[2]	MAJOR[3]	**test trunk *location* l**	MO_TBRI_TRK
TBRI-TRK	MINOR	**test trunk *location* l**	MO_TBRI_TRK
TBRI-TRK	WARNING	**test trunk *location* sh**	MO_TBRI_TRK

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 For additional repair information, also see TBRI-BD (TN2185 ISDN Trunk-Side BRI) on page 1796 and TBRI-PT (ISDN Trunk-Side BRI Port) on page 1803 maintenance documentation.

3 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75 percent of the trunks in this trunk group are alarmed.

The TN2185 circuit pack contains eight, 4-wire ports that interface to the network at the ISDN S/T reference point over two 64-kbps channels (B1 and B2) and over a 16-kbps signaling (D) channel.

NOTE:
S8300 / **G700**: Although the TBRI-TRK MO is provided for a G700 media gateway, this MO only partially supports the G700's MM720 BRI media module.

The B1 and B2 channels can be simultaneously circuit-switched, or individually packet-switched. Only one channel per trunk can be packet-switched due to PPE (Packet Processing Element) limitations. The D channel is either circuit- or packet-switched. Packet switching uses the PPE to combine every D channel into a single physical channel, which is then routed via the concentration highway to the NCE (Network Control Element) and then to the TDM bus. The circuit-switched connections have a Mu-law or A-law option for voice and operate as 64-kbps clear data channels. The packet-switched channels support the LAPD protocol and conform with the CCITT Q.920 Recommendations for D-channel signaling.

LEDs

The three LEDs on the circuit pack's faceplate indicate board status. When illuminated, the red LED indicates a board failure or a major or minor on-board alarm, the green LED indicates that testing is in progress, and the amber LED indicates that the board is in use.

S8100

Hardware Error Log Entries and Test to Clear Values

Table 791: TBRI-TRK Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test Port UCSSPP sh r 1
513 (a)		Service State Audit (Test #256)	WARNING	OFF	
1793 (b)	8, 9		WARNING	OFF	
3073 (c)		Service State Audit (Test #256)			
3585 (d)					
3841 (e)			WARNING	OFF	

1 Run the Short Test Sequence first. If all tests pass, run the Long Test Sequence. Refer to the appropriate test description and follow the recommended procedures.

Notes:

a The far-end has reported that this channel is not administered. The trunks are placed in the out-of-service state.

b The Signaling link is down. See the following Aux Data explanation:

- Aux data 8 indicates the Signaling Link is down.
- Aux data 9 indicates the Port is out of service.

c The Service State Audit failed. The test will be run every 15 minutes until it passes.

d Unexpected Restart message; this error causes no action and is logged only.

e B-Channel Rejection Event; this action causes the Service State Audit, the Call State Audit, and the Test Call Audit to be executed.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below when inspecting errors in the system. By clearing error codes associated with the Service State Audit test (#256), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Signaling Link State Check test (#1251)	X	X	ND
Service State Audit test (#256)	X	X	ND
Call State Audit test (#257)	X	X	ND
ISDN Test Call test (#258) **S8300** / **G700**: This test aborts with Error Code 1412 on a G700 Media Gateway.		X	ND

1 Destructive; ND = Nondestructive

Signaling Link State (#1251)

This test is **non**destructive.

This test checks the current state of the signaling link. The test looks at the board-level translations, checks that the board is physically inserted, gets the state of the D channel and service state of the port.

The test passes if the signaling link (D channel) is connected and operating normally. The test fails if the board is not installed, the signaling link is disconnected, or if the port is out of service. The test aborts otherwise.

Table 792: Test #1251 Signaling Link State Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
1018	ABORT	The test is disabled. **1** Enable the test by entering **enable test #1251**.
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
8	FAIL	The signaling link is down. **1** Consult the procedures for the TBRI-PT MO.

Table 792: Test #1251 Signaling Link State Test

Error Code	Test Result	Description / Recommendation
9	FAIL	The port is out of service. **1** Return the port to an in-service state.
	PASS	The signaling link is connected and operating normally.

2 of 2

Service State Audit (#256)

This test is **non**destructive.

This test performs a service state audit on an ISDN B channel. The test passes if Call Processing informs Maintenance that the Restart message was transmitted successfully, or if the B channel was busy and could not send the message.

The test fails if the board is not inserted or translated properly, or if a reply is not received within a certain amount of time.

The test aborts if the signaling link is disconnected, if a message is already outstanding, or if the necessary resources could not be allocated.

Use **status trunk *trunk-group*/*trunk-member*** to investigate the service state of a TN2185 Trunk-Side ISDN-BRI channel.

Table 793: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be on a valid call. Use **status trunk** to determine when a trunk is available for testing. **1** Check the results of Test #1251 (Signaling Link State Check).
1005	ABORT	The test aborted due to a configuration problem. This test may not be applicable, or it may be disruptive to terminal equipment other than a voice terminal (for example, a modem pool member or Music on Hold). This error can be ignored.
1018	ABORT	The test is disabled. **1** Enable maintenance by entering **y** in the `Maintenance Tests` field on page 2 of the **change trunk-group** screen.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. **1** Check the results of Test #1251 (Signaling Link State test).

1 of 2

Table 793: Test #256 Service State Audit Test

Error Code	Test Result	Description / Recommendation
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times.
1116	ABORT	The trunk is not in a service state which is appropriate for running the test. This test is only performed in the OOS/FE state.
1117	ABORT	A service state audit message is outstanding. **1** Wait two minutes and then try again.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Wait 4 minutes and then check the Error Log for any new errors of type 3073. If there are none, then both sides of the ISDN connection agree on the service state; the negotiation succeeded. If there is a new 3073 error, then the negotiation failed (the far-end switch twice failed to respond within 2 minutes). The switch automatically retries every 15 minutes. If the trunk was initially in-service, it is now placed in the maintenance/far-end state. Incoming calls are accepted, but no outgoing calls can be originated. If an incoming call is presented, another Service State Audit is immediately performed in an attempt to put the TN2185 Trunk-Side ISDN-BRI channel in the proper state.

2 of 2

Call State Audit Test (#257)

This test is nondestructive.

This test performs a call state audit on an ISDN B channel, and upon successful completion, guarantees that both sides of the interface are in a consistent call state for connections using the B channel. The test can be helpful when trying to clear a hung call. If the internal call state data to the near-end switch is different from that of the far-end switch, the call will be torn down.

The test passes if the audit is successful.

The test fails if the board is not inserted, if there is an internal system error, or if a reply was not received within the prescribed amount of time.

The test aborts if the signaling link is disconnected, the request is already active, or if the B channel is in an out-of-service state.

Table 794: Test #257 Call State Audit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	The test is disabled. **1** Enable the test by entering **y** in the `Maintenance Tests` field on page 2 of the **change trunk-group** screen.
1019	ABORT	An audit is already in progress. **1** Wait two minutes and try again.
1113	ABORT	The signaling link has failed, so the system cannot send any messages on behalf of this trunk. **1** Check the results of Test #1251 (Signaling Link State Check).
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times.
1116	ABORT	The trunk is in an out-of-service ISDN service state. **1** A call cannot be present if the trunk is in an ISDN out-of-service state, so a call state audit would be inappropriate. No action necessary. (Use **status trunk**.)
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The audit passed successfully.

ISDN Test Call Test (#258)

This test performs a far-end loop around to a far-end switch over an ISDN trunk. The trunk's service state must be in-service, maint-NE, or out-of-service/NE, and no call can be active on the trunk.

NOTE:
S8300 / **G700**: This test does not execute on a G700 Media Gateway.

A test call connection is established to a far-end switch over the ISDN trunk to be tested. The digital port on a TN711D Maintenance/Test circuit pack generates a test-pattern bit stream that is sent to the far-end switch and echoed back. The received pattern is then compared to the sent pattern and checked for errors that indicate a loss of integrity on the communications path.

If a test call is running when scheduled maintenance starts, the green LED is turned off. To determine whether a test call is still running:

- Issue **list isdn-testcall** and **status isdn-testcall**.
- Check for a lit amber LED on the Maintenance/Test circuit pack.

There are two ways to place an outgoing test call over trunk-side ISDN-BRI facility:

1. The test call connection is established over the TDM bus of the transmit and receive sides of the trunk-side ISDN-BRI facility to a digital trunk testing port on the Maintenance/Test circuit pack (**S8100**: Processor circuit pack). The Maintenance/Test (**S8100**: Processor circuit pack) Digital Port generates a pseudo bit stream.
2. The test call connection is established over the TDM bus of the transmit and receive sides of the trunk-side ISDN-BRI facility to a data channel. This method is selected when no Maintenance/Test circuit pack (**S8100**: Processor circuit pack) resides in the system.

A test is run periodically to check if the call is hung. If so, it gracefully tears down the call to release the resources.

Synchronous Commands

You can demand a synchronous outgoing test call by using the following maintenance commands:

- test trunk *trunk-group-no*/*member-no long* [**repeat** *number*]
- test board *UUCsspp* long [**repeat** *number*]
- test port *port-location* long [**repeat** *number]*

Whenever a circuit translates to a trunk-side ISDN-BRI channel during a long test sequence, an outgoing test call is invoked, and the duration of the test call is 8.6 seconds. Once the test call completes, the bit error rate is retrieved from the Maintenance/Test Digital Port. A bit error rate greater than zero is reported as a failure to the Manager I terminal (MGRI). A failure indicates the need to run further diagnostics.

If no Maintenance/Test circuit pack (**S8100**: Processor circuit pack) exists, an outgoing test call over a trunk-side ISDN-BRI facility is established over a high-speed data channel on the Network Control (NETCON) circuit pack (DATA-BD).

Asynchronous Commands

NOTE:
Only one trunk can be tested in a given port network, until the test call is canceled or completes.

Table 795: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
4	ABORT	There is a problem with the Processor Interface Link. **1** See the PI-LINK (Processor Interface Link) (**S8100**: PKT-INT Maintenance documentation.
1004	ABORT	B channel in use. **1** Issue **status trunk** to determine whether a call is active on this trunk-side ISDN-BRI channel. **2** When the service state indicates in-service/idle, retry the test.

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Table 795: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
1005	ABORT	Bad Configuration (that is, no Maintenance/Test circuit pack (**S8100**: Processor circuit pack)) Issue **test trunk *trunk-group/trunk-member*** and make sure there is a DATA-CHL (NETCON channel) administered**.**
1018	ABORT	Test call is disabled. **1** Enable Maintenance on the Trunk Group screen.
1024	ABORT	(M/T-DIG) Maintenance/Test Digital Port in use. **1** Wait until yellow and green LEDs are turned off on the M/T-BD (Maintenance/Test circuit pack). **2** Retry the test. If problem persists, see M/T-DIG (Maintenance/Test Digital Port) on page 1341.
1113	ABORT	The signaling link has failed; the system cannot send any messages on behalf of this trunk. **1** Check the results of Test #1251 (Signaling Link State Check Test).
1114	ABORT	The signaling link is in a transitional state. **1** Retry the command at 1-minute intervals up to 5 times.
1116	ABORT	The switch could not appropriately change the ISDN service state. **1** Issue **status trunk** to determine whether a call is active on this trunk-side ISDN-BRI channel. **2** If not, check the error and alarm logs for problems with this TBRI-TRK MO.
1117	ABORT	ISDN B-channel maintenance message is already outstanding. **1** Wait two minutes, then try again.
1118	ABORT	Far end of ISDN trunk is not administered. **1** Check the administration of the far-end ISDN trunk. **2** Issue **status trunk**, and try the test again.
1119	ABORT	The test call was aborted due to a normal call attempt on this trunk. The test call is performed only if the trunk is idle. **1** Either wait for the normal call to terminate normally, or force it to be dropped by using **busyout trunk.**
1120	ABORT	The trunk-side ISDN-BRI facility is in the ISDN out-of-service/far-end state. **1** Try to change the service state via Test #256 (Service State Audit test). Then retry this test. However, the trunk may be in the out-of-service/far-end state due to problems at the far-end switch. If that is the case, no remedial action can be taken at this end.
1122	ABORT	There is no test line number for the far-end switch. **1** Check the Trunk Group Administration screen.

Table 795: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
1123	ABORT	There is no Feature Access Code administration for this Facility test. **1** Check the Dial Plan and Feature Administration forms.
S8300 / **G700**: 1412	ABORT	This test does not execute on a G700 media gateway.
2012, None, 2000	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2035	ABORT	The call has timed out, perhaps because of a lack of system resources. **1** Wait 1 minute and try again.
2036, 2037	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2038, 2039	ABORT	A problem occurred while trying to read the test data. **1** Wait one minute and then try again. **2** If the test aborts again in the same manner, there is a serious internal problem. If so, escalate the problem.
2040	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2041	ABORT	The call has timed out, perhaps because of a lack of system resources. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2066	ABORT	Could not establish test call. **1** Retry the command at 1-minute intervals up to 5 times.
2067	ABORT	The call has timed out, perhaps because of a lack of system resources. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2074	ABORT	Bit and Block Error query failed. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, there may be a serious internal problem with M/T-DIG (Maintenance/Test Digital Port). If this is the case, see M/T-DIG (Maintenance/Test Digital Port) on page 1341.

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Table 795: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
2075	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2104	ABORT	Call dropped or could not be originated. **1** Make sure service is provisioned by the network. **2** Check the administration of the far-end test line extension on the trunk group administration screen. **3** Check the administration of the test call BCC (Bearer Capability Class) on the trunk group administration screen. **4** Try the test again.
2201–2205	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2206	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2208	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2209, 2210	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2211	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2212	ABORT	Call terminated by unexpected disconnect. **1** Wait one minute and then try again.
2213	ABORT	The call has timed-out, perhaps because of a lack of system resources. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2214	ABORT	Call terminated by unexpected disconnect. **1** Wait one minute and then try again.

Table 795: Test #258 ISDN Test Call

Error Code	Test Result	Description / Recommendation
2215–2219	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2220	ABORT	Call terminated prematurely. **1** Wait one minute and try again.
2221–2226	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2227	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, escalate the problem.
2042	FAIL	**This is the main purpose of the test.** The comparison of the data sent with the data received indicates a loss of integrity on the communications path. **1** The trunk should be taken out-of-service and the quality of the trunk-side ISDN-BRI facility should be investigated. The investigation should include an in-depth analysis of the facility including the transmission facility and any external equipment such as DACs, CSUs, etc.
	PASS	The call worked. A test pattern was sent and received properly; the communications path is OK if the synchronous test call command was issued. An in-depth analysis of the trunk-side ISDN-BRI facility including the transmission facility and any external equipment such as DACs, CSUs, and others should take place if the bit and block error rates are not acceptable.

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TDM-BUS (TDM Bus)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run[1]	Full Name of MO
TDM-BUS	MAJOR	**test tdm *P***	TDM bus
TDM-BUS	MINOR	**test tdm *P***	TDM bus
TDM-BUS	WARNING	**test tdm *P***	TDM bus

1 ***P*** is the port network's number. Use **list cabinet** to find the port network(s) contained in a given cabinet.

Description

Each port network has a pair of TDM buses, designated TDM bus A and TDM bus B, each with 256 time slots. This division allows for duplication of control channels and dedicated tone time slots. The first five time slots on each bus are reserved for the control channel, which is active on only one bus at a time in each port network. The next 17 time slots are reserved for system tones such as dial tone, busy tone and so on. As with the control channel, these time slots are active on only one bus, A or B, at a time. The rest of the time slots on each bus are for general system use such as carrying call-associated voice data. The 17 dedicated tone time slots that are inactive can also be used for call processing when every other available time slot is in use.

When the system initializes, the control channel is on TDM bus A and the dedicated tones on TDM bus B in each port network. If a failure occurs on one of the two buses, the system will switch any control, tone and traffic channels to the other bus. Service will still be provided, though at a reduced capacity.

The **set tdm *PC*** command has the effect of putting both the control channel and tone time slots on a specified bus, A or B. P specifies the port network's number, and C specifies the TDM bus, A or B. Throughout this discussion, PC refers to a specific TDM bus. References to *port circuit packs* include every circuit pack that terminates on the TDM bus, including the Expansion Interface TN570, and the following service circuit port boards: Call Classifier (TN744), Integrated Announcement (TN750), Maintenance/Test (TN771), Speech Synthesizer (TN725B), Tone Detector (TN748 or TN420). Other terms used are:

- Control Channel Bus: the TDM bus carrying the active control channel
- Non-Control Channel Bus: the TDM bus with the inactive control channel
- Tone Bus: the TDM bus carrying the active tone time slots
- Non-Tone Bus: the TDM bus with the inactive tone time slots

TDM-Bus Fault Detection and Isolation

TDM-bus faults are usually caused by one of the following:

- A defective circuit pack connected to the backplane
- Bent pins on the backplane
- Defective bus cables or terminators

It is possible that a circuit pack can cause a TDM-bus fault and still exhibit trouble-free operation. For example, insertions of any circuit pack into a slot with TDM bus terminations may bend the backplane pins and short two leads together. Since the TDM bus is a shared resource, identification of the cause of a TDM-bus fault can be difficult. If a TDM-bus problem is suspected, run **test tdm *P***. If any of the resulting tests fail, you must perform a manual TDM bus isolation procedure to identify the cause of the problem.

WARNING:

Since the procedure for isolating TDM-bus faults involves removing circuit packs and possibly disconnecting entire carriers, the procedure is extremely destructive to the port network that contains the TDM bus being tested. If possible, arrange to perform this procedure at a time when traffic is minimal.

As circuit packs are removed or entire carriers are disconnected, any active calls terminating on those circuit packs or carriers will be dropped. If you have any hints about a particular circuit pack that may be causing the TDM bus problem investigate those before performing this procedure (for example, look at any circuit packs that were inserted into the PN just before the TDM bus problem appeared.

When straightening or replacing backplane pins in a carrier that contains a CFY1B Current Limiter, power to the *cabinet* must be removed. When straightening or replacing backplane pins in a carrier that does NOT contain a CFY1B Current Limiter, power to that *carrier* must be shut off. Failure to follow this procedure may result in damage to circuit packs and power supplies, and can be hazardous to the technician.

NOTE:

Maintenance software requires TN748 or TN420 Tone Detector circuit pack to test the TDM bus. Before starting these procedures, make sure that one of these is installed in the port network being investigated.

Procedure 1: Isolating TDM-Bus Faults

This procedure is an attempt to isolate the TDM-bus fault to circuit packs that are essential to the system's operation. For each of the following circuit packs in the port network where the TDM-bus fault appears, perform Procedure 1.

Circuit Pack	Error Log Names
Tone-Clock	TONE-BD, TONE-PT, and TDM-CLK
MSS/Network Control*	SW-CTL and H-ADAPTER
Tone Detector	DETR-BD, GPTD-PT, and DTMR-PT
Expansion Interface	EXP-INTF
Packet Interface*	PKT-INT

1. Display the Alarm Log for the circuit pack via **display alarms**.
2. If there are alarms for the circuit pack, refer to that section and try to resolve the alarms.
3. Whether or not every alarm can be cleared, test the TDM bus again via **test tdm *P***.
4. If some TDM-bus tests fail, implement Procedure 1 for the next circuit pack.
5. If every TDM-bus test passes, the problem has been fixed.
6. If every circuit pack in the list has been investigated, go to Procedure 2.

Procedure 2: Removing and Reinserting Port Circuit Packs

Procedure 2 removes and reinserts port circuit packs (those in the carrier's purple slots) one or more at a time. Use this procedure for each port circuit pack in the port network until the problem is resolved or until every circuit pack in the port network have been tried. To execute diagnostic procedures on the Expansion Interface and Tone-Clock circuit packs, see ''Procedure 3: Removing and Reinserting PN Control Circuit Packs''. Although these circuit packs reside in purple slots, procedure 2 does not apply. This procedure *does* apply to the Tone Detector circuit pack.

If the TDM bus problem is present when the circuit pack is inserted, but is resolved when the circuit pack is removed, either the circuit pack or the backplane pins in that slot are causing the problem. If the backplane pins are intact, replace the circuit pack. If some of the tests fail regardless of whether the circuit pack is inserted or removed, and the backplane pins are intact, the circuit pack is not the cause of the problem. In a multiple failure situation, the circuit pack could be one cause of the TDM bus problem. However, other simultaneous failures might also be responsible for TDM-bus faults.

In Procedure 2, an option of working either with one circuit pack at a time or with multiple circuit packs simultaneously is available. In view of this capability, determine the level of service interruption that will be acceptable during the procedure. If causing a disruption to all users in the port network is deemed permissible, large groups of circuit packs should be worked with in order to get the job done quickly. However, *if large service disruptions are to be avoided*, work with one circuit pack at a time. This option is slower, but it disrupts only the users of a single circuit pack.

1 Remove one or several circuit packs as appropriate. Any circuit packs that reside on the TDM bus that were recently inserted should be checked first.

S8100: Remove port circuit packs which have failed the NPE Crosstalk Test (#6) first. To find which circuit packs failed this test, display the Hardware Error Log via the **display errors** command. Refer to the Maintenance documentation of each port circuit pack that has port errors to check if any error indicates the failure of the NPE Crosstalk Test. If no circuit pack failed the NPE Crosstalk Test (#6), remove one or several purple slot circuit packs.

If you decide to remove multiple circuit packs, consider working with an entire carrier at a time to more quickly and reliably determine which circuit packs are not the source of trouble.

2 Run **test tdm *P*** to determine if the TDM-bus fault is still present.

3 If any of the TDM-bus tests fail:

- Determine whether the backplane pins in the removed circuit pack's slot appear to be bent.
- If the backplane pins are not bent, reinsert the circuit pack(s), and perform Procedure 2 for the next set of circuit packs.
- If the backplane pins are bent, remove power to this carrier in the manner described previously.
- Straighten or replace the pins and reinsert the circuit pack.
- Restore power and repeat Procedure 2, beginning with Step 2, for the same circuit pack(s).

4 If none of the TDM-bus tests fail:

- Reinsert the circuit pack(s) *one at a time*, and repeat the following substeps until every circuit pack has been reinserted.
- Run **test tdm *P*** to determine if the TDM-bus fault has returned.
- If any of the TDM-bus tests fail, the reinserted circuit pack is defective. Replace this circuit pack and repeat this procedure for the next circuit pack.
- If none of the TDM-bus tests fail when every circuit pack has been reinserted, the problem has been fixed and the procedure is completed.

Continue with Procedure 3 if every port circuit pack has been checked, but the TDM-bus fault is still not resolved.

Procedure 3: Removing and Reinserting PN Control Circuit Packs

This procedure removes and reinserts a PN's control circuit packs. Use this procedure to test:

- TN570 Expansion Interface
- TN768, TN780 Tone-Clock

Check the Tone-Clock circuit pack next-to-last. Check the Expansion Interface circuit pack (TN570) last, because removing this circuit pack disconnects its PN. In a system with duplicated PNC, dDisruption of traffic can be minimized by following the procedure for the standby TN570 Expansion Interface circuit pack, and then entering **reset pnc interchange**. The formerly active Expansion Interface will be standby and can be checked without affecting the PN's service.

For instructions, at each step in a procedure that requires the removal and/or replacement of a circuit pack, refer to the documentation for the specific circuit pack's MO. Server and/or PNC interchanges may be required to complete these steps with the least amount of service disruption.

Procedure for PN with Unduplicated PNC

1. Remove the suspected circuit pack.
2. As in "Procedure 2: Removing and Reinserting Port Circuit Packs", determine if the backplane pins behind the removed circuit pack's slot are bent.
3. If the backplane pins are bent, do the following:
   a. Power down the control carrier as described in the previous warning statement.
   b. Straighten or replace the pins.
   c. Insert the same circuit pack.
   d. Turn the power back on to reboot the system or to restart the PN.
   e. Run **test tdm *P*** to determine whether the TDM-bus fault still exists.
   f. If none of the TDM-bus tests fail, the procedure is complete.
   g. If some of the TDM-bus tests fail, replace the suspected circuit pack, and go to step 4.

   If not:
   a. Replace the circuit pack.
   b. Turn the power back on to reboot the system.
4. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.
5. If the TDM-bus fault is still present, the suspected circuit pack was not the cause of the TDM-bus failure. Do the following:
   a. Remove the replacement circuit pack that was just inserted and replace it with the previously suspected circuit pack.
   b. Repeat Procedure 3 for the next circuit pack on the list for this procedure.

   If none of the TDM-bus tests fail, the procedure is completed.

If Procedure 3 fails to identify the cause of the problem, go to "Procedure 4: Isolating TDM-Bus Failures to Carriers".

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Procedure for PN with Duplicated PNC

In this type of configuration, the test procedure is made up of several independent parts. In a duplicated system, it is desirable to investigate whether circuit packs are causing TDM-bus problems when they are in active mode, in standby mode, or both. The procedure utilizes a PNC interchange in a PN. If the TDM-bus fault disappears after an interchange takes place, the newly standby Expansion Interface (PN), is suspect and should be replaced. If the problem still exists, the Tone-Clocks are then interchanged. If the TDM-bus failure then disappears, the newly standby Tone-Clock is suspect and should be replaced. If the TDM-bus problem still exists, then the procedure begins diagnostics on individual circuit packs and backplane pins.

Part 1 (PN Procedure)

1. Execute **status pnc** to determine which PNC is currently active.
2. Run **reset pnc interchange** to make the currently active PNC standby.
3. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is gone, replace the formerly active Expansion Interface circuit pack.
4. Run **reset pnc interchange** again to activate the PNC where the new Expansion Interface circuit pack resides.
5. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is gone, the procedure is finished.

   If not, replace the new Expansion Interface circuit pack with the originally suspected circuit pack, and continue with Part 2.

Part 2

1. Run **set tone-clock** to make the currently active Tone-Clock standby.
2. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is gone:

   a. Replace the formerly active Tone-Clock circuit pack.

   b. Run **set tone-clock** again to make the new Tone-Clock circuit pack active.

   c. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

   If the TDM-bus fault is still present, replace the new Tone-Clock circuit pack with the originally suspected circuit pack, and continue with Part 3.

Part 3

Use Part 3 for each individual circuit pack listed in the previous table. Run this procedure on every circuit pack in the standby PNC. If the TDM-bus failure still exists (once every standby circuit pack has been tested), execute **reset pnc interchange**, and **set tone-clock** to put the currently active circuit packs into standby mode so that this procedure can be run on each of them.

1. Remove the inactive suspected circuit pack.
2. As in Procedure 2, determine whether any backplane pins behind the removed circuit pack's slot are bent.
3. If the pins are bent, do the following:

   a. Remove power as described in the previous warning statement.

   b. Straighten or replace the pins.

   c. Restore power.

   d. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.

      If the TDM-bus failure is still present, the problem is with another circuit pack. Reinsert the originally suspected circuit pack, and repeat Part 3 for the next circuit pack.

   e. If the TDM-bus failure has disappeared, reinsert the circuit pack and run **test tdm *P*** to see if the TDM-bus failure is still present.

      If any of the TDM-bus tests fail, replace the suspected circuit pack. The procedure is finished.

      If not, the procedure is finished.

If the backplane pins are not bent, run **test tdm *P*** to determine whether the TDM-bus fault is still present.

a If any of the TDM-bus tests fail, the problem is with another circuit pack. Reinsert the originally suspected circuit pack, and repeat Part 3 for the next circuit pack.

b If not, replace the suspected circuit pack. The procedure is finished.

4 If every standby circuit pack has been tested but the TDM-bus failure still exists, execute **reset pnc interchange** and **set tone-clock** to put the currently active circuit packs into standby mode. Repeat Part 3 of this procedure for each of the newly active circuit packs.

Procedure 4: Isolating TDM-Bus Failures to Carriers

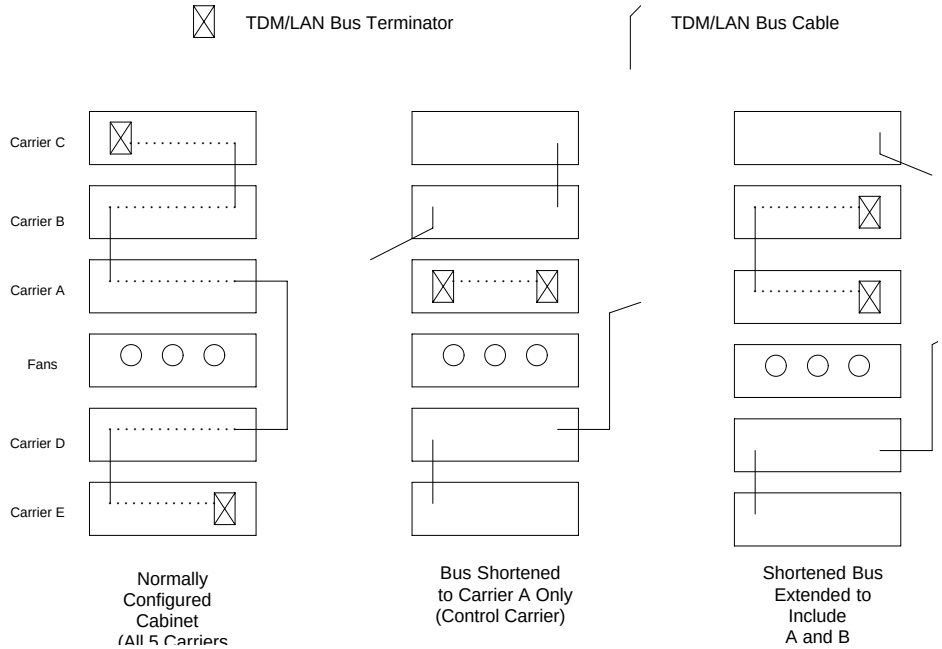
Procedure 4 attempts to isolate a TDM-bus failure to a particular set of carriers. Only the circuit packs in selected carriers are checked. Procedure 4 is used if the preceding procedures fail, because it can help locate failures of:

- Multiple circuit packs
- The carrier's hardware itself

In this procedure, the TDM/LAN cable assemblies and TDM/LAN bus terminators are replaced.

If replacement does not resolve the TDM-bus fault, the cabinet is reconfigured so that certain carriers are disconnected from the TDM bus. This is done by moving the TDM/LAN bus terminators (ZAHF4) on the carrier's backplane. To terminate a TDM bus at the end of a particular carrier, the TDM bus cable that connects the carrier to the next carrier should be unplugged and replaced with a TDM/LAN bus terminator (see Figure 143). As the length of a TDM bus is *modified*, any essential circuit packs to the system's operation and TDM-bus maintenance (for example, MSSNET and Tone-Clock), must still be connected to the *shortened* TDM bus.

Figure 143: Carrier Rewiring Example — Rear View of 5-Carrier Cabinet



After cabling changes are made and verified, power must be restored to the PN. Circuit packs in carriers outside the shortened bus are not inserted. As a result, these circuit packs are alarmed. Ignore these alarms for now. Every alarm should be resolved when the cabinet is restored to its original configuration.

Procedure 4 is organized into two parts. Part 1 attempts to clear a TDM-bus fault by replacing every bus cable and terminator within a PN. Part 2 attempts to isolate the fault to a particular carrier by extending the TDM bus from the control carrier to additional carriers one at a time.

WARNING:

Power must be removed from the entire PN before any cables or terminators are removed. Failure to follow this procedure can cause damage to circuit packs and power supplies, and can be hazardous to the technician.

Part 1

1. If spare TDM/LAN cable assemblies and TDM/LAN bus terminators are not available, go to Part 2 of this procedure.
2. Power down the PN.
3. Replace every TDM/LAN cable assembly and both TDM/LAN bus terminators.
4. Restore power to the PN.
5. Run **test tdm *P*** to determine whether the TDM-bus fault is still present.
6. If the TDM-bus fault is resolved, the procedure is finished. Otherwise, continue with Part 2.

Part 2

1. Terminate the TDM bus so that it extends only across the carrier that contains the active Expansion Interface.

2 Run **test tdm P** to determine whether the TDM-bus fault is still present.

If the *shortened* TDM bus does not extend to a carrier continuing the Tone Detector circuit pack, the:

- Non-control channel test (#297) will not be able to run
- Bus that the non-control channel was on will not be tested.

If this is the case, run **set TDM *PC*** to move the control channel to the non-active bus. The **status port-network *P*** command shows which bus is currently active. After the bus switch has occurred, run **test tdm P** again to determine whether the newly active bus is faulted.

Another option is to move a Tone Detector circuit pack to an empty slot, if one is available, in the carrier where the TDM bus is terminated. This would:

- Allow both the control channel and non-control channel tests to run
- Not require **set tdm *P*** command to be run

3 If none of the TDM-bus tests fail, extend the TDM bus to another carrier, and repeat the procedure in the previous step. When a carrier that causes the fault to recur is added, perform Procedure 2 for only the circuit packs in that carrier.

4 If any of the TDM-bus tests fail and Procedures 2 and 3 did not resolve the problem, the added carrier(s) are defective and must be replaced.

S8100 only

For the Processor Port Network (PPN)

1 Terminate the TDM Bus so that it extends within the control carrier.

2 Run the **test tdm** system technician command. If any of the TDM Bus tests fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in those carriers connected to the *shortened* TDM Bus. Procedure 2 is performed for port circuit packs (purple slots) and Procedure 3 for control carrier circuit packs.

3 If none of the TDM Bus tests fail, extend the TDM Bus to another carrier and repeat this procedure. When a carrier is added that causes some of the TDM Bus tests to fail, perform Procedure 2 and/or Procedure 3 for only the circuit packs in that carrier.

Restarting Non-Functioning Port Circuit Packs

A defective TDM-bus control channel or system-timing reference on one of the EPNs can cause port circuit packs residing outside the PN's control carrier to enter the reset state. When this situation occurs, the circuit pack will stop functioning, and its red LED will light. The system does not detect the presence of a circuit pack when it is in the reset state. Executing **list config board** shows that the circuit pack is absent.

If a circuit pack enters the reset state, it remains out of service until it receives a restart message from the control channel on the same TDM bus (A or B) that was active when it reset, or until it is powered up again.

To force the system to send a restart message to every circuit pack on a network, try one of the following methods, depending on the circumstances. Any normally functioning circuit pack (i.e., not in reset state) will ignore the restart message.

Procedure 1 (Nondestructive)

If the control channel is on the same TDM bus as it was when the circuit pack entered the reset state, issue **test tdm *P*** to execute the Idle Time Slot test (#294).

Procedure 2 (Nondestructive)

If you are on-site, reseat the circuit pack. This action causes the circuit pack in the reset state to begin functioning on the control channel of the *current* bus.

Procedure 3 (Destructive)

Issue the **reset port-network *P* level 2** command to reset the PN containing the circuit pack in the reset state. During a PN reset, two restart messages (one on the control channel of each TDM bus) are sent to each circuit pack in the PN. Resetting the PN disrupts every call going to and originating from the PN.

Procedure 4 (Destructive)

Execute **recycle carrier *PC***. This command removes and restores power to the designated port carrier. Thus, any other circuit packs in this carrier will also be temporarily taken out-of-service.

Error Log Entries and Test to Clear Values

Table 796: TDM Bus Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	**test tdm** *P*
1	0	Control Channel test (#296)	MINOR	ON	**test tdm** *P* **r 3**
18(a)	0	**busyout tdm** *PC*	WARNING	ON	**release tdm** *PC*
35(b)	0-1	TDM bus Corruption	MINOR	ON	**set tdm** *PC*
257(c)	0	None	MAJOR	ON	
513(d)	Any	Idle Time Slot test (#294)	MINOR	ON	**test tdm** *P* **r 3**
769(e)	Any	Idle Time Slot test (#294)	WARNING	ON	**test tdm** *P* **r 3**
769(f)	Any	Idle Time Slot test (#294)			(see Notes)
1025(g)	Any	None			
3872(h)	Any	None			
3873(h)	Any	None			
3874(h)	Any	None			
3877(h)	Any	None			

Error Notes:

a The TDM bus has been busied out by the technician. The error will retire when the technician releases the TDM bus.

b This error indicates the TDM bus is corrupted. If the corruption was on the Control Channel bus, TDM bus maintenance automatically switches the control channel and/or tones to the other bus. The same strategy applies if the corruption was on the bus carrying the tones.

An aux data value of 0 indicates the last reported TDM bus corruption was on the Control channel bus.

An aux data value of 1 indicates the last reported TDM bus corruption was on the Non-Control channel bus.

S8100: If this error is logged on both TDM Buses (A and B) within two or three minutes, the red LED of several circuit packs may or may not be lit and there could be Switch Control errors. Under these circumstances do the following:

- Display the Hardware Error Log via the **display errors** command and look for SW-CTL (Switch Control) errors.
- If there are any errors logged against the Switch Control, try to resolve them.
- Test the TDM Bus via the **test tdm P** command.
- If all the TDM Bus tests pass, the problem has been fixed.
- Test the TDM Bus via the **test tdm P** command.
- If all the TDM Bus tests pass, the problem has been fixed.

c This error indicates the TDM bus was switched to the other bus due to TDM bus corruption. The aux data value is not meaningful and no action is required. Look for other TDM-BUS errors to determine the cause of this error.

d This error indicates that some time slots are corrupted in the specified TDM bus. The Minor alarm is raised when there are more than 50 bad time slots in the bus. The aux data indicates the number of bad time slots found by the test.

e This error indicates that some time slots are corrupted in the specified TDM bus. The Warning alarm is raised when there are more than 10 bad time slots but less than or up to 50 bad ones in the bus. The aux data value indicates the number of bad time slots found by the test.

f This error indicates the idle time slot test found less than 10 bad time slots in the TDM bus. The aux data value indicates the number of bad time slots found by the test. There is no alarm associated with this error.

g This error indicates that the daily TDM bus switch was not successful. The active Expansion Interface (PN) cannot talk on the bus that software was trying to switch into. There is no alarm associated with this error.

h These errors indicate communication problems which may be causing message loss. TDM bus maintenance may switch the Control Channel bus and/or Tone bus to the other bus. Test the TDM bus via **test tdm *P*** and follow the procedures according to the error codes reported from the test. The aux data value shows the Angel ID number for which a downlink message was lost.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order presented. By clearing error codes associated with the *Control Channel* test (#296), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel test on the Control Channel Bus (#296)	X	X	ND
Digit Detection test on the Non-Control Channel Bus (#297)	X	X	ND
Idle Time Slot test (#294)	X	X	ND

1 D = Destructive; ND = Nondestructive

Idle Time Slot Test on TDM bus A or B (#294)

The Idle Time Slot test detects noisy time slots on the bus and takes them out-of-service. The Tone Detector circuit is told to listen to idle time slots and if it detects any noise on a time slot, it returns a failure. At the end of the test, any out-of-service time slots are retested to see if they are still noisy and restored to service if they are idle. After every time slot has been tested, maintenance counts the number of bad time slots and reports the number to the technician in the error code field. No more than 220 time slots will be taken out-of-service on one bus and no more than 300 will be taken out-of-service on both buses at one time.

Table 797: Test #294 Idle Time Slot Test on TDM bus A or TDM bus B

Error Code	Test Result	Description / Recommendation
None	ABORT	Could not allocate the necessary system resources to run this test. For example, maintenance could be running on the Tone Detector circuit and it is using the CPTRs.
1115	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 3 times.
Any	FAIL	The error code indicates the number of bad time slots that were detected. The cause of this failure is most likely due to a bad port circuit pack and not the TDM bus itself. **1** Execute the command again. **2** If the error persists, check the Error and Alarm Logs for alarms, on the port network where the faulted TDM bus resides, on port circuit packs from the NPE Crosstalk test. Also check for EXP-INTF alarms associated with error type 1537. **3** Refer to the appropriate circuit pack's documentation to clear the circuit pack's problem. **4** Test the TDM bus again. If the error continues, see "TDM-Bus Fault Detection and Isolation".
	PASS	The success of this test indicates every idle time slot that is supposed to be idle are indeed idle. There is no noise on any of the idle time slots.

Control Channel Test (#296)

This tests the integrity of the Control Channel bus by ensuring that communication through the TDM bus is operational. The test attempts to query a circuit pack whose presence is required in each port network for proper operation (Tone-Clock or Tone Detector). If a reply from the queried circuit pack is received, the TDM bus is considered operational and the test passes. If no reply is received, the Bus is not operational and the test fails.

Table 798: Test #296 Control Channel Test

Error Code	Test Result	Description / Recommendation
Any other than 1005	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times.
1005	ABORT	Since this test is valid only on the control channel bus, it aborts execution when run on the non-control channel bus. This is a valid response. Use **status port-network** to verify which bus is the control channel bus.

Table 798: Test #296 Control Channel Test

Error Code	Test Result	Description / Recommendation
None	FAIL	Communication through the Control Channel is not working. The problem is not necessarily the TDM bus itself. **1** **S8100**: If the TN2314 Processor circuit pack is the only circuit pack in the system insert one or more port board and execute the **test tdm P** command again. If the test continues to fail go to the next step. **2** Display the hardware error and alarm log for the Tone-Clock circuit and for the Tone Detector circuit in the port network where the faulted TDM bus resides. See ''TONE-BD (Tone-Clock Circuit)'', ''TONE-PT (Tone Generator)'', GPTD-PT (General-Purpose Tone Detector Port) on page 1046, and DTMR-PT (Dual-Tone Multifrequency Receiver Port) on page 870. **3** Resolve the errors and alarms for the Tone-Clock and Tone Detector circuits. **4** Display the hardware error and alarm log and look for errors and alarms for the active Expansion Interface circuit pack. See EXP-INTF (Expansion Interface Circuit Pack) on page 911 and resolve its errors. **5** Execute **test tdm *P*** command. **6** If the test still fails, see TDM-Bus Fault Detection and Isolation on page 1833.
	PASS	Communication through the control channel bus is operational.

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Digit Detection Test (#297)

This test is executed on the Non-Control Channel bus. The Tone-Clock circuit is told to put a tone on the Non-Control Channel bus and the Tone Detector circuit is told to listen to it. The test passes if the tone is successfully transmitted on the Non-Control Channel bus.

Table 799: Test #297 Digit Detection Test

Error Code	Test Result	Description / Recommendation
None, 1001, 2100	ABORT	Could not allocate the necessary system resources to run this test.
1005	ABORT	Since this test is valid only on the non-control channel bus, it aborts execution when run on the control channel bus. This is a valid response. Use **status port-network** to verify which bus is the control channel bus.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 3 times.

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Table 799: Test #297 Digit Detection Test

Error Code	Test Result	Description / Recommendation
None	FAIL	This failure indicates that communication on the Non-Control Channel is not reliable. **1** Execute the command again. **2** If the problem persists, test the active Tone-Clock circuit and Tone Detector circuit/circuit pack in the port network where the faulted TDM bus resides, to make sure they are healthy. See "TONE-BD (Tone-Clock Circuit)", "TONE-PT (Tone Generator)", GPTD-PT (General-Purpose Tone Detector Port) on page 1046, and DTMR-PT (Dual-Tone Multifrequency Receiver Port) on page 870. **3** Execute the command again. **4** If the problems persists, see TDM-Bus Fault Detection and Isolation on page 1833.
	PASS	The non-control channel bus is operational.

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TDM-CLK (TDM Bus Clock)

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MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TDM-CLK	MAJOR	**test tone-clock *location* short**	TDM bus Clock
TDM-CLK	MINOR	**test tone-clock *location* short**	TDM bus Clock
TDM-CLK	WARNING	**release tone-clock *location***	TDM bus Clock

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
Replacing the Tone-Clock circuit pack or the IPSI requires a special procedure described in the documentation for TONE-BD (Tone-Clock Circuit) on page 1902. That section also describes the LED displays for these circuit packs.

The Time Division Multiplex (TDM) Bus Clock resides on the Tone-Clock circuit, providing clocking signals both for the TDM bus and the LAN Bus. The Tone-Clock circuit is a critical component in the system and is necessary to ensure the operation of every port circuit pack in the system. The TDM buses of every EPNs is synchronized together. The system timing reference can be derived internally from the Tone-Clock circuit in any PN, or from an external (off-board) timing reference. Currently, the TDM bus Clock supports synchronizing the TDM bus with interface rates from Digital Signal 1 (DS1) facilities as primary or primary and secondary references, (**S8700**: and from Stratum-3 clock (STRAT-3) facilities. Only the TN780 tone-clock supports a Stratum-3 clock.)

Moreover, the TN2314 Processor/Tone-Clock circuit pack aids in monitoring and selecting synchronization references. The TN2314 Processor/Tone-Clock circuit pack, after detecting that the external source of timing is not valid, will automatically begin its escalation procedure, according to the facilities administered. In the following table, successive losses of signal cause escalation from left to right.

NOTE:
Switching back to a DS1 source is handled by synchronization maintenance, once any problems with it are corrected and tested.
S8700: However, once synchronization has been switched to the internal timing source of the master Tone-Clock circuit, switching back to a Stratum-3 clock must be initiated by a technician after the external reference has been repaired.

Tone-Clock Role	Synchronization Facilities	Initial External Synchronization Source	Backup External Synchronization Source	Internal Source
S8700 MC: MASTER	Stratum-3 clock	Source “A”	Source “B”	Local oscillator
MASTER	DS1 Primary and Secondary	DS1 Primary	DS1 Secondary	Local oscillator
	DS1 Primary Only	DS1 Primary	None	
	No External Source	None	None	
S8700 MC: SLAVE	PNC Duplication	Active EI	Standby EI	
	No PNC Duplication	Active EI	None	

See SYNC (Port-Network Synchronization) on page 1751 for more details about the escalation plan. There is a strong interdependency among the DS1 Interface circuit pack’s Maintenance, Synchronization Maintenance, and TDM Bus Clock Maintenance MOs.

S8700 MC: See ‘‘TONE-BD (Tone-Clock Circuit)’’ on page 1902 for a discussion of the relationship of Tone-Clock circuits with the various reliability options.

Error Log Entries and Test to Clear Values

Table 800: TDM Bus Clock Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Test to Clear Value
0[2]	0	Any	Any	Any	**test tone-clock** *UUC* **sh r 1**
1 (a)	0	None	MINOR	OFF	
18 (b)	0	**busyout tone-clock** *UUC*	WARNING	OFF	**release tone-clock** *UUC*
130 (c)		None			
257 (d)		None	WARNING	OFF	
513 (e)	Any	Clock Circuit Status inquiry (#148)	MINOR[3]	OFF	**test tone-clock** *UUC*
769 (f)	Any	Clock Circuit Status inquiry (#148)	MAJOR‡	ON	**test tone-clock** *UUC* **sh r 10**
1025 (g)	Any	Clock Slip inquiry(#149)			**test tone-clock** *UUC* **sh**
1281, 1282 (h)	Any	None	MINOR	OFF	

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Table 800: TDM Bus Clock Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board[1]	Test to Clear Value
1537	Any	Clock PPM inquiry (#150)			**test tone-clock** *UUC* **sh**
2049 ()	Any	Standby Reference Health Check test (#651)	MAJOR[3]	ON	**test tone-clock** *UUC*
2305 ()	0	None	WARNING	OFF	

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1 As a general rule, any *on-board* errors against the TDM Bus Clock should be resolved before pursuing any other errors against PNC components. *Off-board* clock errors may be caused by other board errors, and should be addressed after on-board errors have been resolved.

2 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

3 Major or Minor alarms on this MO may have been downgraded to Warning based on the values in **set options**.

Notes:

a The IPSI or Tone-Clock circuit pack may have a clock at the edge of its specified frequency. This can cause Expansion Interface circuit packs and SNI circuit packs to go out-of-frame or report no-neighbor conditions. This can is turn cause EPNs, Expansion Archangel Links (EALs), Remote Neighbor Links (RNLs), and/or Local Neighbor Links (LNLs) to go down. When this error is alarmed, Clock Health Inquiry test (#46) will fail with an error code of 1.

1 Replace the IPSI or Tone-Clock circuit pack identified in the error log. See *"Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911*.

b The indicated Tone-Clock circuit has been made unavailable via **busyout tone-clock *UUC***. It only applies to systems with the high- or critical-reliability option administered, because only a standby Tone-Clock circuit may be made busy by that command. To resolve this error, execute **release tone-clock *UUC*** for the alarmed circuit pack.

c This error type indicates that the circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack.

d The Tone-Clock circuit pack in PN 1 is not a TN780 although Stratum-3 synchronization is administered. Either:

1 If a Stratum-3 clock is being used, replace this Tone-Clock with a TN780.

If not, change synchronization administration to Stratum 4.

e The tone-clock has reported an out-of-lock condition. A aux value of 1 indicates this error is an out-of-lock with the primary reference. A aux value of 2 indicates this error is an out-of-lock with the secondary reference. It could not lock onto the frequency of that synchronization reference. This will lead to a change in the synchronization reference if the condition continues.

f **S8100**: The Processor/Tone-Clock module may be defective.

1 Execute the **test tone-clock 1a**. If there are error codes from any tests, follow the recommended maintenance procedures for the error code(s) to resolve the problem(s). If all tests pass, consider the 769 error type to have been a transient problem, and clear the error log entry with **test tone-clock 1a long clear**.

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The IPSI's Tone-Clock circuit or Tone-Clock circuit pack may be defective, however it may be a software failure that can be corrected by testing.

1. Check to see if the board is duplicated (**list cabinet** and **status port-network**) on the affected port network.
2. If the board is not duplicated, use **test tone-clock *UUCSS* long** to resolve the errors. The long test resets the board and is required to reload on-board RAM associated with the TN2182's DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds, meaning that no dial tone or touch tones are available during this interval. This will probably not affect calls in progress, but could cause a call origination to abort or a user not to get dial tone when going off hook.
3. If every test passes and the alarm does not resolve, retest with **test tone-clock *UUCSS* long clear**.
4. If the test passes, terminate the repair process. If the test fails, replace the circuit pack at the customer's convenience.
5. If this error was logged against the standby Tone-Clock, and if the Aux Data value was 18369, SYNC (Synchronization) maintenance acts on this error. No corrective action is required. For any other Aux Data, go to the next step.
6. If the board is duplicated, switch to the standby side (**set tone-clock**).
7. Test the alarmed board (**test tone-clock *UUCSS* long)**. This resets the board and is required to reload on-board RAM associated with the TN2182's DSPs.
8. If every test passes and the alarm does not resolve, retest (**test tone-clock *UUCSS* long clear**).
9. If the test passes, terminate the repair process. If the test fails, replace the circuit pack at the customer's convenience.

g Processor/Tone-Clock circuit on-board maintenance has detected one or more *clock slips*, timing differences between its internal reference source and the synchronization signal provided by the master Tone-Clock. Although no clock slip errors are expected during normal operation, both manual and automatic interchanges of Tone-Clock circuit, synchronization references, and PNCs, may result in clock slip counts.

If error 1281 also is logged for the same Tone-Clock circuit, it is related to this problem and should be corrected first. Otherwise, continue with the following procedure.

1. Use **test tone-clock *UUC***, and examine the results of Test #149 to see if slip errors still appear. If no new slip errors are reported, and if these errors are not causing a TDM-CLK alarm, they may be ignored. Use **test tone-clock *UUC* long clear** to clear the errors.

2 Otherwise, enter **display errors**, and follow corrective procedures for any other TDM-CLK, TONE-BD, SYNC, DS1C-BD, EXP-INTF, SNC-BD, and SNI-BD errors logged, except for those in Table 801.

Table 801: Error Log Entries for Slip Errors

Circuit Pack Name	Error Log Name	Error Log Entry for Slips
DS1 Interface	DS1-BD	3073 to 3160
Expansion Interface	EXP-INTF	2305
Switch Node Interface	SNI-BD	1537
Tone-Clock	TDM-CLK	1025
UDS1 Interface		3073 to 3160
DS1C Circuit Pack	DS1C-BD	3329

3 If 1025 errors persist, see SYNC (Port-Network Synchronization) on page 1751.

h Error Type 1281 — This error is an indication that the Processor/Tone-Clock circuit has detected a loss of timing signal from the system's synchronization reference. The Processor/Tone-Clock circuit has switched synchronization references.

1 Resolve any errors logged against the SYNC or STRAT-3 MOs.

2 See SYNC (Port-Network Synchronization) on page 1751 maintenance, if the error is not resolved by step 1.

Error Type 1282 — Indicates that the TN2182 tone-clock (**S8100**: TN2314 Processor/Tone Clock) was synchronized to a DS1 facility and that the reference frequency provided by the DS1 drifted beyond a range that could be tracked by the TN2182 (**S8100**: TN2314). Therefore the (**S8100**: TN2314) TN2182 is no longer synchronized to that DS1 reference. If a second DS1 is available, the tone-clock may be synchronized to that reference. If no secondary DS1 reference is available, the tone-clock will run off of its internal clock. This may result in slips being reported by the tone-clock and every DS1 facility.

S8100

i Error Type 2049: - The Processor/Tone-Clock module was unable to detect the incoming synchronization signal. If the aux data is 0, the problem is with the signal on the primary. If the aux data is 1, the problem is with the signal on the secondary.

1 If Error 1281 is also logged, it is related to this problem and should be corrected first.

2 Clear all other errors before replacing the Processor/Tone-Clock circuit pack.

3 See the Caution below. Replace the Processor/Tone-Clock circuit pack.

CAUTION:

Reseating/Replacing the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please perform the procedure with caution. Refer to Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)* and Tone-Clock Replacement on page 1546.

WARNING:

When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya S8100 Media Server with the Avaya G600 and CMC1 Media Gateways (555-233-146)*. Retry the command and if the test fails, replace the circuit pack.

S8700 MC

The Tone-Clock circuit in the master port network was unable to detect the incoming synchronization signal, but the other tone-clock was able to detect the references. If the aux data is 0, the problem is with the signal on the primary. If the aux data is 1, the problem is with the signal on the secondary. The system should switch clocks in this situation.

1. If this error is against PN 1's clock board and the system is using a Stratum-3 clock, check the cabling that brings the Stratum-3 signal to this clock board.
2. Replace the current standby IPSI or Tone-Clock circuit pack. See *"Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911*.

S8100

j Error Type 2305: - The indicated Processor/Tone-Clock circuit pack has detected a loss of timing signal.

1. Enter **display errors** and **display alarms**, and follow the associated repair procedures for TDM-CLK error log entries that have on-board alarms.
2. If Error 1281 is also logged, it is related to this problem and should be corrected first.
3. If the 2305 errors persist:

   a Execute the **test synchronization r 10 command** and check to see if new 2305 errors were reported.

   If no new instances of the 2305 errors were logged for either test, then enter **test tone-clock 1a long clear** to clear the TDM-CLK errors and the procedure is complete.
4. If the problem is still not cleared, and the Processor Tone-Clock circuit pack reported in the error log has not been replaced up to now, replace it. See the Caution above.

S8700 MC

Error Type 2305 - The indicated Tone-Clock circuit is an active **slave** Tone-Clock that has detected a loss of timing signal from its EXP-INTF synchronization source. (A slave Tone-Clock resides in a PN that does not contain the system's reference synchronization source.)

1. Enter **display errors** and **display alarms**, and follow the repair procedures for EXP-INTF, TDM-CLK, and TONE-BD error log entries that have on-board alarms.
2. If the 2305 errors persist, follow the repair procedures for EXP-INTF error log entries 257, 769, or 770, or any errors logged against SNI-BD, SNC-BD, or FIBER-LK.

3 If the 2305 errors persist:

   a *For Port Networks with more than one Tone-Clock circuit*, execute **test synchronization r 10** to see if new 2305 errors against TDM-CLK were reported. If not, execute **reset pnc interchange** and **test synchronization r 10** again, and recheck for new 2305 errors against TDM-CLK

   b *For Port Networks with a single Tone-Clock circuit*, execute **test synchronization r 10** to see if new 2305 errors were reported.

   If no new instances of the 2305 errors were logged for either test, enter **test tone-clock *UUC* long clear** to clear the TDM-CLK errors. The procedure is complete.

4 **For Port Networks with more than one Tone-Clock circuit**:

   a Enter **set tone-clock UUC** to interchange the Tone-Clocks.

   b Run **test synchronization r 10** to see if new 2305 errors are reported against the new active Tone-Clock circuit.

   c If not, replace the standby Tone-Clock circuit. See *"Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911*.

   If this clears the error, the problem has been resolved.

5 Replace the EI circuit pack for the active PNC.

6 If the problem is still not cleared and the IPSI or Tone-Clock circuit pack reported in the error log has not yet been replaced, replace it. See *"Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911*.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below when inspecting errors in the system. By clearing error codes associated with the *SAKI Reset* test (#53), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
SAKI Reset test (#53) (a)		X		D
Clock Health test (#46) (b)	X	X		ND
Control Channel Loop-Around test (#52) (a)	X	X		ND
Tone Generator Crosstalk test (#90) (c)		X		ND
Tone Generator Transmission test (#40) (c)	X	X		ND
Tone Generator Audit/Update test (#41) (c)	X	X		ND
TDM bus Clock Circuit Status Inquiry test (#148)	X	X		ND
TDM bus Clock Slip Inquiry test (#149)(e)	X	X		ND

1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
TDM bus Clock PPM Inquiry test (#150)	X	X		ND
TDM bus Clock Parameter Update test (#151)	X	X		ND
Board Type Check test (#574)	X	X		ND
Standby Reference Health Check test (#651) (d)		X		ND

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1 D = Destructive; ND = Nondestructive

Notes:

a See "XXX-BD (Common Port Circuit Pack/Media Module)" on page 2086 for a descriptions of this test.

b See "TONE-BD (Tone-Clock Circuit)" on page 1902 for a description of this test.

c See "TONE-PT (Tone Generator)" on page 1927 for descriptions of this test.

d **S8700 MC**:This test only runs on the standby IPSI or Tone-Clock circuit pack in a port network with more than one IPSI or Tone-Clock circuit pack (high- or critical-reliability option). The Tone-Clock circuit pack must be a TN780 code with firmware revision 2 or above, or be a TN2182.

e Test #149 is not run on the TN2182.

TDM bus Clock Circuit Status Inquiry Test (#148)

The TDM bus Clock circuitry is checked for sanity. Any problems that are found are reported using error codes

Table 802: Test #148 TDM bus Clock Circuit Status Inquiry Test

Error Code	Test Result	Description / Recommendation
None, 1001	ABORT	The system could not allocate the necessary resources for the test. **1** Wait 1-minute, and retry the test.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 802: Test #148 TDM bus Clock Circuit Status Inquiry Test

Error Code	Test Result	Description / Recommendation
1	FAIL	This error means the Tone-Clock circuit framing verification firmware reports an error in the clock synchronization signal coming into this port network. **1** If the Tone-Clock circuit reporting the problem is a master clock, then the system synchronization reference is providing a bad timing source. See SYNC (Port-Network Synchronization) on page 1751 or STRAT-3 (Stratum-3 Clock) on page 1730 to change the system synchronization reference. **2** If the Tone-Clock circuit is a slave clock, then the EI to which it is listening is providing a bad timing source. Follow the diagnostic procedures specified for TDM-CLK Error Code 2305. **3** **S8700** / **S8500**: If no problem can be found with the incoming synchronization signal, replace the IPSI or Tone-Clock circuit pack. See *Replacing the IPSI or Tone-Clock Circuit Pack* on page 1911. --- **S8100** **4** If no problem can be found with the incoming synchronization signal, reset the tone-clock module with the command **reset tone-clock 1a**. **5** See Caution below: If reset tone-clock command does not clear the problem, replace the TN2314 Processor/Tone-Clock board. **CAUTION:** Reseating/Replacing the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please perform the procedure with caution. Refer to Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)* and Tone-Clock Replacement on page 1546 for information on replacing the TN2314 Processor/Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.
2	FAIL	This error indicates that Tone-Clock circuit has inaccurately detected loss of signal on the incoming synchronization timing source.
4 8	FAIL	The local oscillator on the Tone-Clock circuit failed.

Table 802: Test #148 TDM bus Clock Circuit Status Inquiry Test

Error Code	Test Result	Description / Recommendation
16 32	FAIL	The circuitry on the Processor/Tone-Clock circuit used to detect synchronization timing errors has failed. **1** Errors 2, 4, 8, 16, and 32 indicate that there is poor synchronization between port networks and external facilities. It may be noticeable to the customer in the form of errors in data communications. The Tone-Clock circuit is defective. See *"Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911*.
64	FAIL	This message is only sent when an uplink message has reported the loss of valid synchronization timing information coming into this port network. It has been reported in TDM-CLK Error Log entries; one or more of 1025, 1281, 1537, 2049 and 2305. **1** Resolve the errors indicated. No separate corrective action is required.
65	FAIL	The Processor/Tone-clock is currently not able to lock on to the current synchronization reference. If this tone-clock is in the master port networK: **1** Examine the error log for any DS1-BD, SYNC or other TDM-CLK errors and resolve as applicable. **2** Run this test again via **test tone-clock *UUC***. **3** Examine the DS1 measurements to determine whether the facility is healthy. **4** Administer a new synchronization reference. **5** Replace the DS1 board currently supplying the reference. If this tone-clock is in the slave port networK: **1** Examine the error log for any SYNC, EXP-INTF, or TDM-CLK errors. **2** Run this test again via **test tone-clock *UUC***.

Table 802: Test #148 TDM bus Clock Circuit Status Inquiry Test

Error Code	Test Result	Description / Recommendation
66	FAIL	There is an on-board failure of TDM clock hardware. **1** Use **test tone *UUCSS* long** to resolve the problem. The long test resets the board and is required to reload on-board RAM associated with the TN2182"s DSPs. The effect is that tone detectors are taken out of service momentarily and tones are removed from the TDM bus for about 10 seconds. This means that no dial tone or touch tones are available during this interval. It probably will not affect calls in progress, but could cause a call origination to abort or a user will not get dial tone when going off hook. **2** If the test passes and the alarm does not resolve, retest (**test tone-clock *UUCSS* long clear**). **3** If the test passes, terminate the repair process. If it fails, replace the circuit pack at the customer's convenience. **S8100** **CAUTION:** Reseating/Replacing the TN2314 Processor/Tone-Clock circuit pack will disrupt service. Please perform the procedure with caution. Refer to Replacing the TN2314 circuit pack in *Maintenance Procedures (555-245-103)* and Tone-Clock Replacement on page 1546 for information on replacing the TN2314 Processor/Tone-Clock circuit pack. **WARNING:** When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100. Retry the command and if the test fails, replace the circuit pack.
	PASS	TDM bus Clock Circuit Status is sane. There are no clock-detection circuit problems on the Tone-Clock circuit.

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TDM Bus Clock Slip Inquiry Test (#149)

This test evaluates the quality of the synchronization source for the IPSI circuit pack's Tone-Clock circuit or Tone-Clock circuit pack.

NOTE:
This test does not apply to the TN2182.

Table 803: Test #149 TDM bus Clock Slip Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	The system could not allocate the necessary resources for the test.
1001	ABORT	The system could not allocate the necessary resources for the test. **1** Wait 1-minute, and retry the test.
S8100: 255	ABORT	The Processor Tone-Clock module was using its local oscillator rather than synchronizing to an external source. **1** Verify that this Processor Tone-Clock module is expected to be the synchronization source. If not, correct the synchronization information and re-execute the test.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 803: Test #149 TDM bus Clock Slip Inquiry Test

Error Code	Test Result	Description / Recommendation
Any	FAIL	The error code represents the number of timing slips detected on the incoming synchronization source since the last slip inquiry was sent to the Tone-Clock circuit. The incoming synchronization signal can be from one of the following sources: **1** A DS1 Interface circuit pack, if DS1 Synchronization is administered, and associated with the circuit pack tested **2** **S8700 MC**: A Stratum-3 clock, if that option is administered and the circuit pack tested was the active Tone-Clock in the PN 1 **3** **S8700 MC**: The local oscillator on the master IPSI's Tone-Clock circuit or on the master Tone-Clock circuit pack, if it is providing the PN's clocking signals **4** **S8700 IP**: The local oscillator on the IPSI's Tone-Clock circuit providing the media gateway's clocking signals **5** **S8700 MC**: An EXP-INTF circuit pack, if the PN on which the test was executed does not contain the system's current synchronization reference The error code is a variable amount ranging from 1 to 255. **1** Small numbers of slips should not result in service degradation. If the error code is small (1 or 2), rerun the test. If the error only occurs infrequently, it may be ignored. **2** **S8100**:If error 1537 is entered in the hardware error log against TDM-CLK, then the board has switched timing sources. Follow the procedures associated with hardware log error code 1537. **3** Otherwise, see Synchronization Troubleshooting in SYNC (Port-Network Synchronization) on page 1751 of this manual.
	PASS	The IPSI or Processor/Tone-Clock circuit pack does not detect any timing slips. This indicates that the incoming synchronization timing source is valid or that the system's synchronization reference is an IPSI or Processor/Tone-Clock circuit pack. Use **status synchronization** to verify that the desired synchronization reference is providing timing for the system.

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TDM bus Clock PPM Inquiry Test (#150)

This test evaluates the quality of the synchronization source for the Tone-Clock circuit.

Table 804: Test #150 TDM bus Clock PPM Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	The system could not allocate the necessary resources for the test.
1001	ABORT	The system could not allocate the necessary resources for the test. **1** Wait 1-minute, and retry the test.
255	ABORT	The test was not executed because the IPSI or Processor/Tone-Clock circuit pack was using its local oscillator rather than synchronizing to an external source. **1** Verify that this IPSI or Processor/Tone-Clock circuit pack is expected to be the synchronization source. If not, correct the synchronization information and re-execute the test.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	The error code represents the rate (in Parts Per Million, or PPM) at which clock slip errors have been detected on the incoming synchronization source since the last PPM inquiry was sent to the IPSI or Processor/Tone-Clock circuit pack. A failure of this test indicates that we are outside of (**S8700 MC**: Stratum-3) or Stratum-4 timing specifications on the incoming timing source. The error code is a variable amount ranging from 1 to 254. **1** If error 1537 is entered in the hardware error log against TDM-CLK, then the board has switched timing sources. Follow the procedures associated with hardware log error code 1537. **2** Otherwise, see ‘‘Troubleshooting Approach’’ in the SYNC (Port-Network Synchronization) on page 1751 section of this manual.
	PASS	The IPSI or Processor/Tone-Clock circuit pack does not detect timing any PPM errors. This indicates that the external synchronization timing source is valid or that the system synchronization reference is an IPSI or Processor/Tone-Clock circuit pack. Use **status synchronization** to verify that the desired synchronization reference is providing timing for the system.

TDM Bus Clock Parameter Update Test (#151)

This test updates the following internal parameters on the IPSI or Tone-Clock circuit pack:

- Disables in-line duplication status messages.
- **S8700 MC**: Disable in-line subrate frame maintenance messages (TN768, TN780 only).
- **S8700 MC**: Sets the PPM threshold at 60 PPM for TN768 and TN780.

  Sets the PPM threshold at 85 PPM for TN2182 and TN2312.

  S8100: Sets the PPM threshold at 85 PPM for the TN2314.
- Enables PPM threshold switching.

- Sets the number of slips to trigger *loss of signal* - currently 30 per 5-millisecond period.
- Enables the on-board synchronization switching algorithm (see above).
- Enables holdover operation (TN2182 and TN2312 only).

  S8100: Enables holdover operation (TN2314 only).

This is not a test. It always passes without identifying or reporting any IPSI or Tone-Clock circuit pack errors.

Table 805: Test #151 TDM Bus Clock Parameter Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The IPSI or Processor/Tone-Clock circuit pack parameters have been successfully updated.

S8700 MC

Board Type Check Test (#574)

This test verifies that a Tone-Clock circuit pack administered with a Stratum-3 clock source has code TN780.

Table 806: Test #574 Board Type Check Test

Error Code	Test Result	Description / Recommendation
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
ANY	FAIL	Stratum-3 clock synchronization is administered for the carrier where this Tone-Clock circuit pack resides, but the Tone-Clock does not have code TN780. **1** If the Stratum-3 clock option is incorrectly administered, remove it. **2** Otherwise, replace the circuit pack. See *"Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911*.
	PASS	The proper Tone-Clock circuit pack code (TN780) is present for Stratum-3 clock synchronization.

Standby Reference Health Check Test (#651)

This test evaluates the quality of the external synchronization timing source for a standby IPSI or Tone-Clock circuit pack. Every administered synchronization timing source must be valid for this test to pass. If the Tone-Clock circuit and the synchronization timing sources are in different port networks, the EI circuit packs transport the timing sources to the tone-clock.

Table 807: Test #651 Standby Reference Health Check Test

Error Code	Test Result	Description / Recommendation
	ABORT	This test may already be running due to a tone-clock installation, scheduled maintenance, alarm activity, or a technician-demand test from another terminal. This abort can also occur due to an internal system error. **1** Try the command again at 1-minute intervals up to five times.
1184	ABORT	This test requires an external synchronization source to be administered (DS1 primary, DS1 primary and secondary, or Stratum-3 clock). **1** Administer the external synchronization source and retry the test.
2500	ABORT	Internal system error **1** Try the command again at 1-minute intervals up to 5 times.
0	FAIL	The external synchronization timing source for side A of the Stratum-3 clock or for the primary DS1 reference is either absent or invalid. The external synchronization timing source for side B of the Stratum-3 clock or the secondary DS1 reference is not yet tested.
1	FAIL	The external synchronization timing source for side B of the Stratum-3 clock or for the secondary DS1 reference is either absent or invalid. **1** Correct the synchronization source problem. See SYNC (Port-Network Synchronization) on page 1751. **2** If the error still exists, replace the IPSI or Tone-Clock circuit pack reported in the error log. See "Replacing the IPSI or Tone-Clock Circuit Pack" on page 1911.
	PASS	The external synchronization timing source is valid.

TDMODULE (Trunk Data Module)

S8700 / S8500 S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TDMODULE	MINOR	**test port *location* l**	Trunk Data Module
TDMODULE	WARNING	**test port *location* l**	Trunk Data Module

1 For information on specifying a ***location***, see Command Syntax on page 179.

The TDMODULE (Trunk Data Module) is covered in the PDMODULE (Processor Data Module) TDMODULE (Trunk Data Module) on page 1373.

TIE-BD (Tie Trunk Circuit Pack)

S8700 / S8500 S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command To Run[1]	Full Name of MO
TIE-BD	MINOR	**test board *location* sh**	Tie Trunk Circuit Pack
TIE-BD	WARNNG	**test board *location* sh**	Tie Trunk Circuit Pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for circuit-pack level errors. See TIE-TRK (Analog Tie Trunk) on page 1881 for trunk information.

TIE-DS1 (DS1 Tie Trunk)

S8700 / S8500 / S8100 / S8300

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
TIE-DS1[1]	MAJOR[2]	**test trunk *grp/mbr* l**[3]	DS1 Tie Trunk
TIE-DS1	MINOR	**test trunk *grp/mbr* l**[3]	DS1 Tie Trunk
TIE-DS1	WARNING	**test trunk *grp/mbr***	DS1 Tie Trunk

1 For additional repair information, see DS1-BD (DS1 Interface Circuit Pack) on page 760 if the tie trunk is on a TN722 or TN767 DS1 circuit pack. See UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 UDS1-BD documentation if the tie trunk is on a TN464C/D UDS1 circuit pack. See MG-DS1 (DS1 Interface Media Module) on page 1255 if the tie trunk is on an MM710 DS1 Interface Media Module.

2 A MAJOR alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75% of the trunks in this trunk group are alarmed.

3 For TN767B vintage 8 or 9 circuit packs, a failure of Test #136 causes a subsequent failure of Test #7. Test #136 is part of the short sequence and generates off-board alarms. Test #7 is part of the long sequence and generates on-board alarms. Before entering busyout, release, reset or test board long commands, check the vintage number of the circuit pack with **list configuration board *location***. If it is TN767B vintage 8 or 9, do not use the above commands until you ensure that Test #136 passes via test board short. Otherwise, extraneous on-board alarms may be generated.

NOTE:
For information on specifying a ***location***, see Command Syntax on page 10.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration form. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506* for information on how to administer trunks. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

The DS1 tie trunk provides both voice and data communications between two PBX switches. There are two types of DS1 interfaces:

- 24 DS0 channels on a 1.544-Mbps link
- 31 DS0 channels + 1 framing channel on a 2.048-Mbps link

NOTE:
32-channel mode is supported only on TN464 circuit packs.

DS1 Tie Trunks are used widely in the Distributed Communications System (DCS) and Central Attendant Service (CAS) system features. A DS1 tie trunk can also be used as an access endpoint which is a non-signaling channel with bandwidth for voice-grade data, 56- or 64-kbps data. DS1 tie trunk maintenance provides a strategy to maintain a DS1 tie trunk via a port on the TN722 or TN767 DS1 Interface circuit pack, the TN464C/D UDS1 Interface circuit pack, or the MM710 DS1 Interface Media Module.

Throughout this TIE-DS1 section, the term DS1 Interface applies to DS1 or UDS1 circuit packs, or to MM710 Media Modules.

NOTE:
S8300 / **G700**: Although the TIE-DS1 MO is provided for a G700 Media Gateways, this MO only partially supports the MM710 DS1 Media Module.

The DS1 tie trunk maintenance strategy covers logging DS1 tie trunk hardware errors, running tests for trunk initialization, periodic and scheduled maintenance, system technician-demanded tests, and alarm escalation and resolution. Three different trunk service states are specified in DS1 tie trunk maintenance:

Out-of-service	The trunk is deactivated and cannot be used for incoming or outgoing calls.
In-service	The trunk is activated and can be used for both incoming and outgoing calls.
Disconnect (ready-for-service)	The trunk is in an activated state but can only be used for an incoming call.

If the DS1 Interface circuit pack or media module is out of service, every trunk on the DS1 Interface circuit pack or media module is placed into the out-of-service state and a Warning alarm is raised.

Hardware Error Log Entries and Test to Clear Values

Table 808: DS1 Tie Trunk Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test trunk <*grp*/*mbr*>**
1*	57476 57477 57485 57487				
15 *	Any	Port Audit and Update Test (#36)			
18 *	0	**busyout trunk <*grp*/*mbr*>**	WARNING	OFF	**release trunk <*grp*/*mbr*>**[2]
19 *	0	None			
130 *		None	WARNING	ON	**test trunk <*grp*/*mbr*>**
257 *	57473 57474				
513 *	57392	DS1 Tie Trunk Seizure Test (#136)	MAJOR[3] MINOR		
769 *	57393	DS1 Tie Trunk Seizure Test (#136)	MAJOR MINOR[3]		
1025		DS1 Tie Trunk Seizure Test (#136)	MINOR WARNING[4]	OFF	**test trunk <*grp*/*mbr*> r 2**
1281		Conference Circuit Test (#7)	MINOR WARNING[4]	ON	**test trunk <*grp*/*mbr*> l r 4** [2]
1537		NPE Crosstalk Test (#6)	MINOR WARNING[4]	ON	**test trunk <*grp*/*mbr*> l r 3** [2]
1793 *					**test board** <*address*> **long** [2]
2305 *	50944	DS1 Tie Trunk Seizure Test (#136)	MAJOR MINOR[3]	OFF	
2562 *	16665				
2817 *	52992				
3840 *	Any	Port Audit and Update Test (#36)			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 For TN767B vintage 8 or 9 circuit packs, a failure of Test #136 causes a subsequent failure of Test #7. Test #136 is part of the short sequence and generates off-board alarms. Test #7 is part of the long sequence and generates on-board alarms. Before entering busyout, release, reset or test board long commands, check the vintage number of the circuit pack with **list configuration board <address>**. If it is TN767B vintage 8 or 9, do not use the above commands until you ensure sure that Test #136 passes via test board short. Otherwise, extraneous on-board alarms may be generated.

3 This alarm is raised only when the **System-Parameter Country** form has the Base Tone Generator field is set to **4** (Italy). This alarm is a MINOR alarm unless 75% or more trunks in this trunk group are out of service, then the alarm is upgraded to a MAJOR alarm.

4 Major or Minor alarms on this MO may be downgraded to Warning based on the values used in **set options**.

Error Additional Information:

- **Error Type 1:** The DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. This error can be caused by incompatible translations. Make sure the parameters administered on the DS1 circuit pack or media module form match those administered on the far-end switch. See *Administrator's Guide for Avaya™ Communication Manager, 555-233-506* for details.

  The Aux Data field indicates the following hardware error types:

57476	On-hook before wink
57477	On-hook before ready to receive digits
57485	Wink too short for valid signal
57487	The timer expired while waiting for an off-hook signal from the far end as a response at end-of-digits dialing. Check the far-end switch for related problems.

  If every administration parameter between the switch and the far end match and these errors continue to recur, follow normal escalation procedures.

  Error Type 15: This is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors (if any).

- **Error Type 18:** The DS1 tie trunk has been busied out with **busyout trunk *grp/mbr***. No calls can be made on this trunk except for the Facility Access Test call. See *Administrator's Guide for Avaya™ Communication Manager, 555-233-506.*

  Error Type 19: Indicates that the far end may be out-of-service, or the Electronic Tandem Network may be busied out.

  Error Type 130: This error type indicates that the circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

  Error Type 257: The DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. The trunk cannot communicate with the far end because it is unable to interpret digits sent from the far-end switch. The Aux Data field indicates the following:

57473	The rotary dial rate is below 8 pulses per second.
57474	The rotary dial rate is above 12 pulses per second.

  Check with the far-end switch or operating company for proper trunk connection.

  Error Type 513: DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. The trunk is in-service/active and waiting for an "on-hook" from the far-end switch. No calls can be routed over the trunk while it is in this state. Aux Data 57392 indicates no external release on PBX disconnect. Check with the far-end switch or operating company for proper trunk connection.

  Error Type 769: The DS1 Interface circuit pack or media module detects a hardware error on the DS1 tie trunk. This error usually occurs after an occurrence of error type 513. The trunk has received the belated "on-hook" that it has been waiting for from the far-end switch. The trunk is restored to in-service/idle and can be used for calls. Aux Data 57393 indicates delayed external release on PBX disconnect. This error can be ignored.

Error Type 1793: The DS1 Interface circuit pack or media module is out-of-service. See the appropriate DS1-BD (DS1 Interface Circuit Pack) on page 760, "UDS1-BD (UDS1 Interface Circuit Pack)" on page 1950, or MG-DS1 (DS1 Interface Media Module) on page 1255 documentation for details.

Error Type 2305: Reorder message. The trunk could not be seized. This error causes the Trunk Seizure test (#136) to run and is only a problem if the Seizure test fails (in which case Error Type 1025 also appears). In this case, the trunk may be put in "Ready-for-Service" state (shown as "disconnected" by the status command), which allows only incoming calls. Run the Trunk Seizure test (#136) and follow its procedures.

Error Type 2562: Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

Error Type 2817: Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and the far ends. Attempt to place the call again. If the error persists, execute the DS1 Tie Trunk Seizure test (#136) and follow its outlined procedures.

Error Type 3840: Port Audit and Update test (#36) failed due to an internal system error. Enter **status trunk**, and verify the status of the trunk. If the trunk is out-of-service, enter **release trunk** to put it back to in-service. Retry the test command.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk* test (#6), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **S8500** / **G700**: This test aborts with Error Code 1412 on the G700.		X	ND
Conference Circuit test (#7) **S8500** / **G700**: This test aborts with Error Code 1412 on the G700.		X	ND
DS1 Tie Trunk Seizure test (#136)	X	X	ND
Port Audit and Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NOTE:
For TN767B vintage 8 or 9 circuit packs, a failure of Test #136 causes a subsequent failure of Test #7. Test #136 is part of the short sequence and generates off-board alarms Test #7 is part of the long sequence and generates on-board alarms. Before entering **busyout**, **release**, **reset** or **test board <*address*> long** commands, check the vintage number of the circuit pack with **list configuration board <*address*>**. If it is TN767B vintage 8 or 9, do

not use the above commands until first making sure that Test #136 passes via **test board <*address*> short**. Otherwise, extraneous on-board alarms may be generated.

NPE Crosstalk Test (#6)

NOTE:
S8500 / **G700**: This test aborts with Error Code 1412 on the G700.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually only part of a port's long test sequence and takes on the order of 20 to 30 seconds to complete.

Table 809: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is active but the port is idle (no calls), check the error log for Error Type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1-minute intervals up to 5 times.

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Table 809: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue **list measurements tone-receiver** to display basic information about the system's tone receivers. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run because of a previously existing error on the specific port or a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
S8500 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: • 1281 — Loss of signal • 1793 — Blue alarm • 2049 — Red alarm • 2305 — Yellow alarm • 1537 — Hyperactivity Look for the above error types in the Hardware Error Log and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 809: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	FAIL	This can be due to either on- or off-board problems. Off-board problems of concern include EXP-PN and EXP-INTF faults (**S8700 MC**), RMC-ENV faults (**S8700 IP**), TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear every off-board problem before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. **1** Resolve any EXP-PN, EXP-INTF, or RMC-ENV errors. **2** Resolve any TDM-BUS errors. **3** Resolve any TONE-BD and/or TONE-PT errors. **4** Retest when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board's translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board <*address*>**. **3** Issue **reset board <*address*>**. **4** Issue **release board <*address*>**. **5** Issue **test board <*address*> long** . This should re-establish the linkage between the internal ID and the port. If not, check that there is a valid board inserted.

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Conference Circuit Test (#7)

NOTE:
S8500 / **G700**: This test aborts with Error Code 1412 on the G700.

One or more Network Processing Elements (NPEs) reside on each circuit pack with a TDM-bus interface. (The TN464C/D UDS1 circuit pack has one SCOTCH-NPE chip instead of several NPE chips). The NPE controls port connectivity and gain, and provides conferencing functions on a per-port basis. The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 810: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions, or it may have time slots out of service due to TDM-BUS errors. Use **status health** to determine if the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors and is not handling heavy traffic and the port status is idle, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of tone detectors present or some of the tone detectors may be out of service. Issue **list measurements tone-receiver** to display basic information about the system's tone receivers. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a user for a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.

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Table 810: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1018	ABORT	Test disabled by administration. This only applies to analog stations. **1** To enable test, set the Test field on the **Station Administration** form for the particular analog station being tested to **y**. Use **change station** <***extension***>.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or circuit pack, and attempt to diagnose the previously existing error.
S8500 / **G700**: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required to run this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	At least one of the following errors is found on the DS1 circuit pack: 1281 – Loss of signal,1793 – Blue alarm, 2049 – Red alarm, 2305 – Yellow alarm, or 1537 – Hyperactivity. Look for the previous error types in the Hardware Error Log, and follow the procedures given in the appropriate DS1-BD or UDS1-BD maintenance documentation for the listed error types.

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Table 810: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	FAIL	The NPE of the tested port did not conference the tones correctly. This can cause noisy and unreliable connections. **1** Enter **list configuration board <*address*>**. If the circuit pack is a TN767B vintage 8 or 9, replace the circuit pack with a TN767C V3 or later. The error log may have error type 1281 entries. **2** Test every administered trunk on the board. If one fails, this could be an off-board problem (such as an incoming seizure or an off-hook port seizure during the test). Retest the board. **3** If every port fails, check the CARR-POW (see note below). **4** If several ports fail, check the error log for TONE-BD or TONE-PT errors. If there are such errors, take the appropriate action. When the TONE errors have cleared, rerun the test. **5** If the retry passes and troubles have been reported, coordinate isolation with the far-end PBX. Make sure that the near- and far-end switches and any NTCE equipment (the CSUs) have the correct administration. **6** Replace the circuit pack. **Note:** If the conference circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. **S8700 MC**: If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. To investigate problems with a 631DB AC or 645B DC power unit, see CARR-POW (Carrier Power Supply) on page 578. If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack. **S8700 IP**: If a TN736 or TN752 power unit circuit pack is present, the power unit may be defective. To investigate problems with a power unit, see RMC-ENV (Power/Fan Sensors) on page 1593.
	PASS	The port can correctly conference multiple connections. User-reported troubles on this port should be investigated using other port tests and by examining station, trunk, or external wiring.

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Table 810: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board's translations are correct. Use **list config**,, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board <*address*>**. **3** Issue **reset board <*address*>**. **4** Issue **release board <*address*>**. **5** Issue **test board <*address*> long**. This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

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Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the DS1 Interface circuit pack or media module to ensure that the trunk's translation is correct. Translation updates include the following data: trunk type (in/out), dial type, timing parameters, and signaling bits enabled. The port audit operation verifies the consistency of the current state of the trunk kept by the DS1 Interface circuit pack or media module and the switch software.

Table 811: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** If the port status is active but the port is idle (no calls), check the error log for error type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.

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Table 811: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
1006	ABORT	The test was aborted because the trunk is out of service. **1** Use **status trunk** to verify that the trunk is out of service. **2** If the trunk is out of service, determine why. **3** If it is OK to put the trunk back in service, issue **release trunk** to restore the trunk's service, and then retry the test.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Trunk translation has been updated successfully. The current trunk states kept in the DS1 Interface circuit pack or media module and switch software are consistent. If the trunk is busied out, the test does not run but returns a PASS. To verify that the trunk is in-service: **1** Enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to step 2. **2** Enter **release trunk** to put the trunk back into in-service. **3** Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board's translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board <*address*>**. **3** Issue **reset board <*address*>**. **4** Issue **release board <*address*>**. **5** Issue **test board <*address*> long**. This should re-establish the linkage between the internal ID and the port. If not, check that there is a valid board inserted.

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DS1 Tie Trunk Seizure Test (#136)

The DS1 Tie Trunk Seizure test is run to verify the trunk's signaling capability. The test is composed of two parts. The first part queries the circuit pack or media module for the following errors: Loss of Signal, Red alarm, Blue alarm, Yellow alarm, and Hyperactivity alarm. The second part of the test is performed by sending a seizure message to the DS1 Interface circuit pack or media module and expecting an active reply by the DS1 Interface circuit pack or media module. If maintenance software does not

receive any reply and the timer expires, the test fails. Once the active message is received, a dial pause message is sent to the DS1 Interface circuit pack or media module. If the DS1 Interface circuit pack or media module replies with a dial pulse tone message when the far end responds to the seizure, then the DS1 tie trunk Seizure test passes. If the far end does not respond to the seizure and the timer expires, and the DS1 Interface circuit pack or media module sends a reorder message back to the maintenance software, then the test fails.

This second part of this test *cannot* be run on a trunk if one of the following cases is true:

1 The trunk direction is administered as an incoming only trunk.

2 The trunk is the 24th port on a DS1 Interface circuit pack or media module which is administered using 24th common-channel signaling.

3 The trunk has been seized by a normal trunk call.

4 The trunk is administered with maintenance test disabled.

5 The outgoing signal type of the trunk is either automatic or immediate-start.

This test always passes if the associated board is the TN802 IP trunk circuit pack.

Table 812: Test #136 DS1 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test were not available. The port may be busy with a valid call. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is active but the port is idle (no calls), check the error log for Error Type 1025 (see the error log table for a description of this error and required actions). The port may be locked up. **3** If the port status is idle, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	Far end is seizing the trunk while the test is ongoing. A glare situation is detected. Current test is designed to be aborted. **1** Use **display port <*address*>** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the port is in use, wait until the port is idle before testing. **2** If the port status is idle, retry the command at 1-minute intervals up to 5 times.

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Table 812: Test #136 DS1 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
1005	ABORT	Test failed due to incompatible configuration administered in ***Trunk Group*** form. **1** Verify the following fields on the ***Trunk Group*** administration form: **a** Is trunk direction incoming only? **b** Is trunk outgoing type either automatic or immediate-start? **c** Is trunk the 24th port of the DS1 Interface circuit pack or media module while common control channel signaling is specified? **2** If the trunk has been administered using the above information, this test should abort.
1018	ABORT	The test was disabled by translation. You may want to determine why the test has been disabled before you enable it. **1** Verify that the `Maintenance Test` field on the **Trunk Administration** form is **n**. To enable the test, change the trunk administration and enter **y** in the `Maintenance Test` field. **2** Repeat the test.
1020	ABORT	The test did not run due to an already existing error on the specific port or due to a more general circuit pack or media module error. **1** Examine the error log for existing errors against this port or the circuit pack or media module and attempt to diagnose the already existing error. **2** Retry the test.
1040	ABORT	The test is invalid for this trunk port because it is administered as an access endpoint. **1** Use **display port <*address*>** to verify that this port is administered as an access endpoint. In this case the test should abort.
2000	ABORT	Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT /FAIL	At least one of the following errors is found on the DS1 circuit pack or media module: 1281 – Loss of Signal, 1793 – Blue alarm, 2049 – Red alarm, 2305 – Yellow alarm, or 1537 – Hyperactivity. **1** Look for the previous error types in the Hardware Error Log, and follow the procedures given in the appropriate DS1-BD, UDS1-BD, or MG-DS1 maintenance documentation for the listed error types. Earlier G1 software versions reported Error Code 2053 as a FAIL.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 812: Test #136 DS1 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
	FAIL	The far-end trunk did not respond to the seizure of the near-end trunk within the allowable time period. This test could have associated in-line errors in the error log. **1** Enter **list configuration board <*address*>**. If the circuit pack is a TN767B vintage 8 or 9, a failure of test 136 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports are taken out of service, and extraneous on-board alarms are generated. Replace the circuit pack with a TN767C V3 or later. **2** Verify that the `Trunk Type` field on the **Trunk Administration** form matches the trunk type administered on far-end switch. **3** Look for DS1-BD, UDS1-BD, or MG-DS1 errors in the hardware error log. If present, see DS1-BD (DS1 Interface Circuit Pack) on page 760, "UDS1-BD (UDS1 Interface Circuit Pack)" on page 1950, or MG-DS1 (DS1 Interface Media Module) on page 1255 maintenance documentation. **4** Retry the test at 1-minute intervals up to 5 times.
2000	FAIL	Response to the seizure message was not received within the allowable time period. **1** Enter **list configuration board <*address*>**. For circuit packs: If the circuit pack is a TN767B vintage 8 or 9, a failure of test 136 causes a subsequent failure of test 7 due to a firmware bug. Eventually, the board and all of its ports are taken out of service, and extraneous on-board alarms are generated. Replace the circuit pack with a TN767C V3 or later. **G700**: Replace the Media Module. **2** Verify that the `Trunk Type` field on the **Trunk Administration** form matches the trunk type administered on far-end switch. **3** Look for DS1-BD, UDS1-BD, or MG-DS1 errors in the hardware error log. If present, see the DS1-BD (DS1 Interface Circuit Pack) on page 760, "UDS1-BD (UDS1 Interface Circuit Pack)" on page 1950, or MG-DCP (Digital Line Media Module) on page 1254 maintenance documentation. **4** Retry the test at 1-minute intervals up to 5 times.
	PASS	The trunk can be seized for an outgoing call.

Table 812: Test #136 DS1 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Check to ensure that the board's translations are correct. Use **list config**, and resolve any problems that are found. **2** If the board was found to be correctly inserted in step 1, issue **busyout board <*address*>**. **3** Issue **reset board <*address*>**. **4** Issue **release board <*address*>**. **5** Issue **test board<*address*> long** . This should re-establish the linkage between the internal ID and the port. If this is not the case, check to see that there is a valid board inserted.

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TIE-TRK (Analog Tie Trunk)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1, 2]	Full Name of MO
TIE-TRK	MAJOR[3]	**test port *location* l**	Tie Trunk
TIE-TRK	MINOR	**test port *location* l**	Tie Trunk
TIE-TRK	WARNING	**test port *location* sh**	Tie Trunk

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 If ATMS testing is enabled, check the error log for ATMS errors 3840 and 3841. If the error log indicates that measurements exceeded acceptable thresholds, and no other trouble is found with **test trunk**, run the ATMS test call with **test analog-testcall port UUCSSpp full**.

3 A Major alarm on a trunk indicates that alarms on these trunks are not downgraded by **set options** and that at least 75 percent of the trunks in this trunk group are alarmed.

This alarm does not apply to TN497.

NOTE:
Many trunk problems are caused by incorrect settings of parameters on the trunk group administration screen. Settings must be compatible with the local environment and with parameter settings on the far end. Refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506*. The Application Notes section of that book shows the correct settings for administrable timers and other parameters on a country-by-country basis.

NOTE:
S8100: If ATMS testing is enabled, check the error log for ATMS Errors #3840 and #3841. If the error log indicates that measurements exceeded acceptable thresholds, and if no other trouble is found with the **test trunk** command, run the ATMS test call with the **test analog-testcall port PCSSpp full** command.

The following circuit packs, including every suffix such as TN760D, support analog tie trunks:

Table 813: Analog Tie Trunk Circuit Packs

Code	Trunk Type	Signaling Leads
TN760	4-wire	E&M
TN437	4-wire	E&M
TN439	2-wire	A&B (2-way circuits only)
TN458	4-wire	E&M
TN497	2-wire	A&B
TN2140	4-wire	E&M

Each tie trunk circuit pack occupies a port circuit pack slot and contains 4 port circuits. Each port circuit supports 1 analog tie trunk used to connect the switch to another PBX across 1- or 2-way dedicated circuits (see preceding list). **S8100**: Each tie trunk for the TN497 circuit packs has 2-wire audio connection/signal leads (A and B).

A tie trunk port can also be administered as an access endpoint which is a non-signaling channel with a voice-grade data bandwidth. Tie trunk maintenance employs up to 6 tests, depending on the hardware involved, to monitor the operating condition of the trunk and its connections. The port must be idle for these tests to run. If an incoming call seizes the port while a test is in progress, the test aborts and the call proceeds (except for TN497).

S8100

The test are as follows:

1. NPE Crosstalk Test—Verifies the switch connection operation of the circuit pack. It verifies that the trunk circuitry talks only on the selected time slot on the TDM Bus and that it never crosses over to time slots reserved for other connections.
2. Loop Around and Conference Circuit Test—Verifies the transmission operation of the circuit pack. It verifies that signals are transmitted to and from each port (Loop Around within the port), and it tests the conference capabilities of all ports.

   This test may fail due to noise induced by adjacent electric power lines. Customers having this problem should resolve it with their local power company. To temporarily alleviate the alarm caused by the failure of this test, the test may be disabled from trunk administration test field.
3. Several seizure tests, including the following:
   - Tie Trunk Seizure Test verifies the seizure capabilities of the circuit pack. For the TN2140B circuit pack, this test activates the M lead and checks for a response from the distant end within 10 seconds. This test ABORTS on trunk ports administered as access endpoints.
   - Seizure Test (for TN497 circuit packs only)—Verifies the seizure capabilities of the circuit pack. This test seizes the trunk and outpulses a “pause.” The port reports the result of the seizure attempt uplink. The test can be disabled via Trunk Group Administration.
4. EPF, M, and E Lead Test ABORTS on trunk ports administered as access endpoints. This test consists of two parts:
   - E lead test—Checks for the proper activation and deactivation of the port’s E lead.
   - M lead test—Checks the M lead EPF current flow. The results of this test allow for distinguishing between circuit pack and external facility failures.
5. Port Audit Update Test (Audit & Update Test for the TN497 circuit pack)—Sends non-disruptive administrative updates to the circuit pack with no expected response. The test updates the translation information on individual ports of the Tie Trunk. Except for the TN497 circuit pack, these updates include:
   - Immediate, automatic, wink start, or delay dial; for the TN2140B,continuous-seize-ack
   - For the TN2140B, continuous or discontinuous.
   - Rotary or DTMF senderization in or out
   - Disconnect timing
   - DMTF time slot

Additional in-line testing is performed whenever a call is in progress, logging errors that occur during operation. You can reproduce these types of errors by making a call over the trunk and then checking the Hardware Error Log.

By making translation and cross-connect changes, circuit packs (except for TN497) can be configured for back-to-back testing, also known as connectivity testing. Port operation is tested by connecting two tie trunk ports together in either E&M or simplex modes. See the section Analog tie trunk back-to-back testing in *Maintenance Procedures (555-245-103).*

Error Log Entries and Test to Clear Values

Table 814: TIE Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port *UUCSSpp* sh r 1**
1 (a)	16384	None	WARNING	OFF	
1 (b)	57476	None	WARNING	OFF	
1 (c)	57477	None	WARNING	OFF	
1 (d)	57483	None	WARNING	OFF	
1 (e)	57485	None	WARNING	OFF	
15 (f)	Any	Port Audit Update test (#36)			
18 (g)	0	**busyout trunk *grp/mbr***	WARNING	OFF	**release trunk *grp/mbr***
130 (h)		None	WARNING	ON	**test trunk *grp/mbr***
257 (i)	57473	None	WARNING	OFF	
257 (j)	57474	None	WARNING	OFF	
257 (k)	57475	None	WARNING	OFF	
513 (l)	Any	EPF M and E Lead (#74)	MAJOR MINOR WARNING[2]	OFF	**test port *UUCSSpp* sh r 3**
769 (l)	57481	EPF M and E Lead (#74)	MAJOR MINOR WARNING[2]	ON	**test port *UUCSSpp* sh r 3**
1025 (m)	Any	None	MAJOR MINOR WARNING[2]	OFF	
1281 (l)	Any	EPF M and E Lead (#74)	MAJOR MINOR WARNING[2]	ON	**test port *UUCSSpp* sh r 3**
1537		Looparound and Conference (#33)	MAJOR MINOR WARNING[2]	ON	**test port *UUCSSpp* l r 3**

Table 814: TIE Trunk Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1793		Tie Trunk Seizure (#73) (Dial Test #747 for TN439)	MAJOR MINOR WARNING[2]	OFF	**test port *UUCSSpp* sh r 2**
2049		NPE Crosstalk (#6)	MAJOR MINOR WARNING[2]	ON	**test port *UUCSSpp* l r 3**
2305 (n)	57424 50944	None (**l**)			
2561 (o)	0	None	WARNING	OFF	
2562 (p)	16665				
2817 (o)	0	None	MINOR	OFF	
2817 (q)	52992				
3073 (o)	0	None			
3840 (r)	8000	Transmission tests (ATMS)(#844–848)		OFF	**test analog-testcall**
3841 (r)		Transmission tests (ATMS)(#844–848)	MINOR	OFF	**test analog-testcall** *UUCSSpp* **r 2**

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning based on the values used in **set options**. If the MINOR alarm is not downgraded, the MINOR alarm is upgraded to a MAJOR alarm if 75% of the trunks in this trunk group are alarmed. These errors, if applicable, always log a MINOR alarm for TN439 and TN497.0

Error Notes:

a Digit time-out. This occurs when the far-end PBX began transmitting digits too late (10 seconds) after receiving the signal indicating ready to receive digits (if any). This can occur on an incoming immediate, wink, or delay dial line. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

b Rotary dial before wink. This occurs when the far-end PBX starts dialing before the PBX sends the wink on a wink-start or delay-dial trunk. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

c Rotary dial too early. This occurs when the far-end PBX starts dialing too soon (about 50ms) after seizure on a wink start or delay dial line. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

d On hook before wink. This occurs when the far end goes on hook before a wink. Check the far-end PBX to ensure a translation match at both ends. This error applies only to TN439.

e On an outgoing wink-start or delay-dial trunk, the wink time was too short (less than 80ms) for a valid signal. Check the far-end PBX to ensure a translation match at both ends. This error does not apply to TN497.

f This is a software audit error that does not indicate any hardware malfunction. Run the short test sequence, and investigate associated errors (if any).

g This indicates that the trunk in question has been busied-out by maintenance personnel.

h The circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack. TN439 does not alarm this error. This error does not apply to TN497.

i The rotary dial rate was too slow — less than 8 pulses per second. Check the far-end PBX to ensure a translation match at both ends.

j The rotary dial rate was too fast — above 12 pulses per second. Check the far-end PBX to ensure a translation match at both ends.

k The time between digits was too short (less than 300ms). Check the far-end PBX to ensure a translation match at both ends.

l These errors do not apply to TN439 and TN497.

m This indicates that the trunk is still seized with an incoming call. The far-end PBX is not releasing the trunk after the call was dropped. Check the far-end PBX for problems.

Once the trunk is released from the call, the severity of this problem is decreased. If Error Type 1025 does not appear again, this means that the problem has been corrected. Verify that Error Type 1025 does not reappear in the Error Log.

n Reorder message. The trunk could not be seized. This error causes the Tie Trunk Seizure test (#73) to run and is considered a problem only if that test fails, logging error 1793. In this case, the trunk may be placed in the ready-for-service state, allowing only incoming calls. This service state shows up as `disconnected` on the trunk status screen. Run the Tie Trunk Seizure test, and follow recommended procedures.

TN439 logs aux data 57424 or 50944. Other circuit packs log 50944. This error is associated with Test #747 for TN439, Test #73 for TN497, and no test for the others.

o These errors apply only to TN497.

p Retry Failure error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error comes from call processing and is generated when a second attempt (retry) to seize an outgoing trunk fails.

q Glare error. This error is logged only. It is not a hardware failure and hence does not start any testing or generate any alarms. This error is the result of a simultaneous seizure of a 2-way trunk from both the near and the far ends. Attempt to place the call again. If the error persists, execute the Tie Trunk Seizure test (#73), and follow its outlined procedures.

r Error 3841 indicates that test calls made by the Automatic Transmission Measurement System (ATMS) returned measurements in the unacceptable range. Error 3840 indicates measurements were in the marginal range. Use **list testcall detail** to examine the specific transmission parameters which are out of spec, and investigate the trunk for that kind of noise. If the noise is acceptable, then the AMTS thresholds administered on page 4 of the trunk group screen should be changed.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order in Table 815. By clearing error codes associated with the *NPE Crosstalk* test (#6), you may clear errors generated from other tests in the testing sequence.

Table 815: System Technician-Demanded Tests: TIE-TRK

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6)		X	ND
Looparound and Conference Circuit test (#33)		X	ND
Tie Trunk Seizure test (#73)	X	X	ND
Dial test (#747)	X	X	ND
Tie Trunk EPF test (#74)	X	X	ND
Port Audit and Update test (#36)	X	X	ND
Transmission test - ATMS (#844-848)	[2]		ND

1 D = Destructive, ND = Nondestructive

2 ATMS tests are not part of either sequence. They are run either on demand with **test analog-testcall**, or by the ATMS schedule.

NPE Crosstalk Test (#6)

The NPE Crosstalk test verifies that a port's NPE channel talks on the time slot assigned to it and does not cross over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. The test takes 20 to 30 seconds to complete.

Table 816: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **1** If the port status is active, but the port is idle (no connected ports), then check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	System resources required to run this test are not available. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.

Table 816: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the test at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **S8100**: Non-TN497 circuit packs only.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
Any	FAIL	This test can fail due to either on- or off-board problems. Off-board problems of concern include EXP-PN, EXP-INTF, or RMC-ENV faults, TDM-BUS faults, and faults associated with the tone detectors/tone generators. Clear every off-board problem before replacing the board. Keep in mind that a TDM-BUS problem is usually the result of a faulty board connected to the backplane or bent pins on the backplane. **1** Resolve any EXP-PN, EXP-INTF, or RMC-ENC errors. **2** Resolve any TDM-BUS errors. **3** Resolve any TONE-BD and/or TONE-PT errors. **4** Test the board when the faults from steps 1, 2, and 3 are cleared. Replace the board only if the test fails.
	PASS	The port is correctly using its allocated time slots. User-reported troubles on this port should be investigated using other port tests and examining station, trunk or external wiring.

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Table 816: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board**. This should re-establish the linkage between the internal ID and the port.

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Looparound and Conference Circuit Test (#33)

This test verifies signal transmission and conferencing capabilities of a port using 404-, 1004-, and 2804-Hz tones. This is an on-board test only: each tone is transmitted to and looped around within the port and then returned.

This test can fail due to noise induced by adjacent electric power lines. If this is the case, the customer must resolve it with their local power company. To temporarily alleviate an alarm caused by failure of this test, you can disable it via the `Test` field on the trunk administration screen.

Table 817: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
7	ABORT	The conference circuit test was aborted. **1** Retry the command at 1-minute intervals up to 5 times.
129	ABORT	The 404-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period.
131		The 1004-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period.
133		The 2804-Hz reflective loop around test aborted. Response to the test request was not received within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 817: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **1** If the port status is active, but the port is idle (no calls), then check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized force. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **S8100**: Non-TN497 circuit packs only.
1018	ABORT	The test has been disabled by administration. Verify that the `Maintenance Test` field on the ***Trunk Group*** screen is **n**. To enable the test, use **change trunk-group *x*** where ***x*** is the number of the trunk group to be tested, and enter **y** in the `Maintenance Test` field**.**
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 817: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
7,	FAIL	The conference capabilities of the port failed (Error Code 7).
129,		The reflective 404-Hz Tone test failed. No transmission was detected to or from the port (Error Code 129).
131, or		The reflective 1004-Hz Tone test failed. No transmission was detected to or from the port (Error Code 131).
133		The reflective 2804-Hz Tone test failed. No transmission was detected to or from the port (Error Code 133). FAULT ISOLATION: Proceed as follows unless power or tone problems are suspected (see notes on the next page). **1** To make sure the problem is on-board, disconnect the port from the CO and retry the test. Coordinate this with the CO, or do it after busy hours; otherwise, the CO may put the connection out of service. **2** If the retry fails, replace the circuit pack. **3** If the retry passes and no troubles were reported, disable the test. If the retry passes and troubles were reported, refer the problem to the CO.
7, 129, 131, or 133 *(cont'd)*	FAIL *(cont'd)*	If the loop-around and conference circuit test fails for every port on a circuit pack, a -5 Volt power problem is indicated. **S8700 MC**: If a TN736 or TN752 power unit circuit pack is present, either the 631DB AC power unit or the 676B DC power unit may be defective. (The 631DB power unit is used in a medium cabinet powered by an AC source. The 645B power unit is used in a medium cabinet powered by a DC power source.) The system may contain a TN736 or TN752 power unit or a 631DB AC power unit, but not both types of power units. **S8700 IP**: If a TN736 or TN752 power unit circuit pack is present, the power unit may be defective. To investigate problems with a 631DB AC or 645B DC power unit, see CARR-POW (Carrier Power Supply) on page 578 (**S8700 MC**) , or RMC-ENV MO (**S8700 IP**). If a red LED on TN736 or TN752 power unit circuit pack is on, replace the pack. If the test fails on more than 1 port, check for errors on the TONE-BD or the TONE-PT. If errors, take appropriate actions. When the tone errors are cleared, rerun the test. If the test fails again, see FAULT ISOLATION in this table above.
	PASS	Tie trunk Looparound and Conference test is successful. This port is functioning properly. **1** If users are reporting troubles, examine loop connections to the port.

Table 817: Test #33 Looparound and Conference Circuit Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board**. This should re-establish the linkage between the internal ID and the port.

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Audit Update Test (#36)

This test sends to the circuit pack updates of translations for every administered port on the circuit pack. It is non-disruptive and guards against possible corruption of translation data contained on the circuit pack. No response is expected from the circuit pack. Port translation data (**S8100**: Non-TN497 circuit packs only) includes:

- Start type: immediate, automatic, wink-start, or delay dial
- Rotary or DTMF senderization in or out
- Disconnect timing: 10 to 2550 ms in 10-ms increments
- DMTF time slot
- Continuous-seize-ack (TN2140)

Table 818: Test #36 Audit Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
S8100: 1006	ABORT	(TN497 circuit pack only.) The port is in the out-of-service state. The test cannot be run. **1** Retry the command once the port is in service.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.

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Table 818: Test #36 Audit Update Test

Error Code	Test Result	Description / Recommendation
	PASS	This test passed. Translation information was successfully updated on the circuit pack. If the trunk is busied out, the test does not run but returns a PASS (except on TN439 and TN497). **1** If signaling troubles are reported, verify translation information for this port. (Non-TN497 circuit packs only.) If the trunk is busied out, the test does not run, but it does return PASS. **2** To verify that the trunk is in-service, enter **status trunk** to verify that the trunk is in-service. If the trunk is in-service, no further action is necessary. If the trunk is out-of-service, continue to Step 2. **3** Enter **release trunk** to put trunk back into in-service. **4** Retry the test command.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board**. This should re-establish the linkage between the internal ID and the port.

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Tie Trunk Seizure Test (#73) and Tie Trunk Dial Test (#747)

For wink-start, delay-dial and TN2140 (cont-seize-ack or discont-seize-ack) trunks, this test activates the M lead and checks for a response from the far end within 10 seconds.

For TN497, the test seizes a trunk and outpulses a pause. The port reports uplink the result of the seizure. This test can be disabled via the `Test` field on the trunk group administration screen.

For TN439, Test #747 is run instead of #73. This test seizes a trunk and outpulses a pause digit. This test aborts on ports administered as access endpoints.

Table 819: Test #73,#747 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

1 of 3

Table 819: Test #73,#747 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **1** If the port status is active, but the port is idle (no calls), then check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. The far-end PBX may not be releasing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	**S8100**: Non-TN497 circuit packs only. The port was seized by a valid call during the test. The test has been aborted. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not valid for this trunk translation. Must be a wink-start (**S8100**: Non-TN497 circuit packs) or delay dial trunk and must be outgoing or 2-way for this test to run. For the TN2140, the trunk must also be continuous-seize-ack or discontinuous-seize-ack. **1** Check trunk translation. If it is not a wink-start or delay dial trunk, this abort message should be ignored.
1018	ABORT	Test disabled via administration. **1** Verify that the `Maintenance Tests` field on the Trunk Group screen is **n**. To enable the test, issue **change trunk-group *x*** where ***x*** is the number of the trunk group to be tested, and enter **y** in the `Maintenance Tests` field.
1040	ABORT	**S8100**: Non-TN497 circuit packs only. This test is not performed for trunk ports administered as access endpoints. **1** Verify this port is an access endpoint by using **display port**. **2** If the port has been administered as an access endpoint, then this test should abort.
S8100: 2000	ABORT	Seizure message is not received back within 10 seconds. **1** Retry the command at 1-minute intervals a maximum of 5 times. **2** If the test continues to fail, check the far-end PBX to ensure a translation match at both ends. **3** Check the facility.

Table 819: Test #73,#747 Tie Trunk Seizure Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
3	FAIL	No dial tone detected from the other end. (TN439 circuit packs only.) **1** Retry the command at one minute intervals up to five times. **2** If the test continues to fail, check the far-end PBX to ensure a translation match at both ends. **3** Check the facility.
S8700: 2000	FAIL	Seizure message is not received back within 10 seconds. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, check the far-end PBX to ensure a translation match at both ends. **3** Check the facility.
	PASS	The relevant Seizure test passes. This port is functioning properly. **1** If users are reporting troubles, examine loop connections to the port, wiring, and stations.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board**. This should re-establish the linkage between the internal ID and the port.

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Tie Trunk EPF Test (#74)

The first part of this test checks for proper activation and deactivation of the port's E lead. The second part checks the M lead electronic power feed current flow.

Table 820: Test #74 Tie Trunk EPF Test

Error Code	Test Result	Description / Recommendation
	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 820: Test #74 Tie Trunk EPF Test

Error Code	Test Result	Description / Recommendation
1	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The trunk may be busy with a valid call. Use **display trunk-group *xx*** to determine trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **1** If the port status is active, but the port is idle (no calls), then check the Error Log for Error Type 1025 (see Error Log table for description of this error and required actions). The port may be locked up. The far-end PBX may not be releasing. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. Use **display trunk-group *xx*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	This test is not valid for this trunk translation. Must be a type-1 standard trunk for this test to run. **1** Check trunk configuration. If it is not a type-1 standard trunk, this abort message should be ignored.
1014	ABORT	The test was aborted because the circuit pack has not been inserted into the system. **1** Use **list configuration board** to ensure that the circuit pack is inserted in the carrier. **2** If the board is not inserted, make sure the circuit pack is inserted in the carrier and fully seated.
1040	ABORT	This test is not performed for trunk ports administered as access endpoints. **1** Verify this port is an access endpoint by using **display port**. **2** If the port has been administered as an access endpoint, then this test should abort.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run the test. This could be due to a failure to seize the port. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The E lead test failed due to an on-board port problem. **1** Replace the circuit pack.

Table 820: Test #74 Tie Trunk EPF Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The M lead test failed. The EPF has experienced an overcurrent condition, perhaps due to the external M lead. **1** To make sure the problem is on-board, disconnect the facility from the pack and retry the test. **2** If the test fails, replace the circuit pack. Otherwise, check the external wiring toward the far-end PBX.
	PASS	Tie Trunk EPF test is successful. This port is functioning properly. **1** If users are reporting troubles, examine loop connections to the port.
0	NO BOARD	The test could not relate the internal ID to the port (no board). **1** Verify that the board's translations are correct. Translate the board, if necessary. **2** Issue **busyout board**. **3** Issue **reset board**. **4** Issue **release board**. **5** Issue **test board**. This should re-establish the linkage between the internal ID and the port.

3 of 3

Transmission Test (#844-848)

This test is nondestructive.

NOTE:
Tests #844–848 are not supported on an International switch.

These tests are run by the Automatic Transmission Measurement System (ATMS). They are not part of the long or short trunk test sequences. Instead, they are run on demand with the **test analog-testcall** command or as part of ATMS scheduled testing. For more information, see Automatic Transmission Measurement System in *Maintenance Procedures (555-245-103)*.

The test call is run from an analog port on a TN771 Maintenance/Test circuit pack. It attempts to seize a port and make a call to a terminating test line (TTL) on the trunk's far end. Transmission performance measurements are made and compared to administered thresholds. Errors are generated when results fall outside of "marginal" or "unacceptable" thresholds. Detail and summary measurement reports are obtainable via the **list testcalls** command.

Table 821: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Use **display port *UUCSSpp*** to determine the trunk group/member number of the port. Use **status trunk** to determine the service state of the port. If the service state indicates that the port is in use, then the port unavailable for this test. (Refer to section on "status" commands for a full description every possible state). Wait until the port is idle before retesting. **2** If the port status is idle, then retry the command at 1-minute intervals up to 5 times.
1001	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate timeslots for the test. The system may be under heavy traffic conditions or it may have timeslots out of service due to TDM bus errors. **1** If the system has no TDM bus errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use status trunk to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	Trunk has been administered as incoming-only; transmission tests can only be run on outgoing trunks.
1115	ABORT	The near end test line on the TN771 (**S8100**: TN2314) circuit pack could not be allocated. **1** Verify that the TN771 (**S8100**: TN2314) circuit pack is in service and that port 1 is administered and in service with **status port**. **2** Retry the command at 1-minute intervals up to 5 times.
1900	ABORT	The test completion message was not received from the TN771 (**S8100**: TN2314) circuit pack. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1901	ABORT	This error occurs when the TN771 (**S8100**: TN2314) circuit pack uplinks a message that is not the proper response for this test. The anticipated uplink messages are seize, ring or answer. **1** Verify that the Trunk is administered properly.
1905	ABORT	Intercept tone detected from far end. **1** Get the test line data and verify it with the far end. Dial the test number manually to see if the TTL is reached. If it is not, then either the number is wrong, or the far end is administered incorrectly.

Table 821: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1906	ABORT	Reorder tone detected from far end. **1** See actions for error code 1905.
1907	ABORT	Other unexpected tone detected from far end. **1** See actions for error code 1905.
1913	ABORT	Audible Ring detected from far end. **1** See actions for error code 1905.
1914	ABORT	Unidentified interrupted tone detected from far end. **1** See actions for error code 1905
1915	ABORT	Busy tone detected from far end. **1** Since the test line at the far end was busy. Try the test again. **2** If the test continues to abort, the problem is with the far-end system.
1918	ABORT	Test progress tone not removed from far end (type 105 test line only). **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 or ADFTC).
1919	ABORT	Unexpected far-end release **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 or ADFTC).
1920	ABORT	No response from far end. **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 or ADFTC).
1921	ABORT	No data returned from far end. **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 or ADFTC).
1922	ABORT	Steady, unidentifiable tone from far end. **1** See actions for error code 1905.
1923	ABORT	Broadband energy detected from far end (such as voice or announcement). **1** See actions for error code 1905.
1924	ABORT	No test tone from far end **1** See actions for error code 1905.
1938	ABORT	Near-end self test failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1939	ABORT	Loss self check at 0dBm at 1004 Hz failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.

Table 821: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
1940	ABORT	Far-end noise self check failed. **1** The problem is with the far-end system; a technician at the far end should test the test line (TN771 or ADFTC) (**S8100**: TN2314).
1941	ABORT	High frequency singing return loss self check failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1942	ABORT	Echo return loss self check failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1943	ABORT	Singing return loss self check failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1944	ABORT	Loss self check at -16 dBm at 1004 Hz failed. **1** Test the TN771 circuit packs
1945	ABORT	Loss self check at -16 dBm at 404 Hz failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1946	ABORT	Loss self check at -16 dBm at 2804 Hz failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
1947	ABORT	Noise with tone self check failed. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
2000	ABORT	The test timed out while waiting for a response from the TN771 (**S8100**: TN2314) circuit pack. **1** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	An internal software error occurred. **1** Retry the command at 1-minute intervals up to 5 times.
2053	ABORT	The test call could not be established, but explanatory information is unavailable. **1** Retry the command at 1-minute intervals up to 5 times.
2056	ABORT	An error occurred while trying to obtain results from the TN771 (**S8100**: TN2314) circuit pack. **1** Test the TN771 (**S8100**: TN2314) circuit packs.
	FAIL	Measured transmission performance was in the unacceptable range as administered on the trunk group screen. Retrieve a measurement report via **list testcalls**. Make sure that ATMS thresholds are set properly on page 4 of the trunk group screen. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.

Table 821: Test #844-848 Transmission Test

Error Code	Test Result	Description / Recommendation
	FAIL	Measured transmission performance was in the unacceptable range as administered on the trunk group form. Retrieve a measurement report via the **list testcalls** command. Make sure that ATMS thresholds are set properly on page 4 of the Trunk Group form. Besides the facility, test failures can be caused by faulty test lines or switch paths. If the measurements point to a facility problem, report the results to the trunk vendor.
S8100: 8000	FAIL	Measured transmission performance was in the marginal range as administered on the trunk group screen. This generally means that the trunk is usable but has an undesirable amount of noise or loss. If the user does not report unacceptable effects, it may not be necessary to take any action. Retrieve a measurement report via **list testcalls**. Make sure that ATMS thresholds are set properly on page 4 of the ***Trunk Group*** screen.

TIME-DAY (Time of Day)

S8700 / S8500

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run	Full Name of MO
TIME-DAY	MINOR	**set time**	Time of Day

The time of day contains the current year, month, day of the week, day of the month, hour, minute, and second. The Time of Day MO monitors the time-of-day clock, and raises an alarm if the time-of-day clock is not set or cannot be read by the software. If the time-of-day clock is not set or cannot be read by the software, many features such as Time-of-Day Routing, CDR, ISDN Call-by-Call, and duplication, are inoperative or incorrect. Use **set time** to set the time-of-day clock when the system is initially powered up.

Use **display time** to read the time-of-day clock. Use **set time** to set the time-of-day clock. The time-of-day clock has a backup battery to save the time of day during power failures.

Error Log Entries and Test to Clear Values

Table 822: Time-of-Day Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0	0	Any	Any	Any	**display time**
247[1]	0	none	MINOR	OFF	**set time**

1 This error indicates that software cannot read the time-of-day clock. During this condition, every time stamp in Alarm Log entry, Hardware Error Log entry, and Software Error Log entry is potentially inaccurate. In addition, any features that are sensitive to the time of day (such as SMDR, Time-of-Day Routing, ISDN Call-by-Call) will not function correctly.

To resolve the alarm, do the following:

1. Use **set time** to set the time of day.
2. Use **display time** to display the time of day. If the time of day is displayed correctly, wait 15 minutes and verify that the alarm is retired.

TONE-BD (Tone-Clock Circuit)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TONE-BD	MAJOR	**test tone-clock *location* sh**	Tone-Clock circuit
TONE-BD	MINOR	**test tone-clock *location* sh**	Tone-Clock circuit
TONE-BD	WARNING	**release tone-clock *location***	Tone-Clock circuit

1 For information on specifying a ***location***, see Command Syntax on page 179.

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The TONE-BD MO supports PNs in a system using either a TN2312 IP Server Interface (IPSI) circuit pack, or for non-IPSI EPNs equipped with Tone Clock circuit packs.

For IPSI-equipped EPNs, the TONE-BD MO consists of a module located on the IPSI circuit pack and provides tone generation, tone detection, call classification, clock generation, and synchronization. It replaces the TN2182B Tone-Clock board and is inserted into each PN's Tone-Clock slot. For non-IPSI EPNs, the TN2182B Tone-Clock circuit pack provide the previous functions.

The TN2312 IPSI circuit pack, for a PN equipped with IPSIs, or the Tone-Clock circuit pack, for a non-IPSI PN, both contains two independent components:

- Tone Generator that provides every tone needed by the system
- Clock that generates the system clocks for both the Time Division Multiplex (TDM) bus and the packet (LAN) bus

It also aids in monitoring and selecting internal synchronization references.

S8100

The Tone-Clock circuit pack functionality is provided by two independent objects in the same circuit pack. The tone generator provides all the tones needed by the system and the clock generates the system clocks for the Time Division Multiplex (TDM) Bus and aids in monitoring and selecting internal synchronization references.

When resolving an IPSI or Tone-Clock circuit pack's errors/alarms, the following sections should also be consulted:

- For non-IPSI EPNs, use the **set tone-clock *UC*** command to establish the tone and synchronization resources for the system.
- For IPSI EPNs, use **set ipserver-interface** to establish the tone and synchronization resources for the system.
- TONE-PT (Tone Generator)
- TDM-CLK (TDM Bus Clock)
- SYNC (Synchronization)
- ETR-PT
- PKT-INT (IPSI only)

The TN2182 is a combined Tone-Clock/Detector circuit pack, providing Tone-Clock functionality to a non-IPSI PN. It provides 8 Enhanced Tone Receiver (ETR) ports. Each of these ports combines the individual capabilities of a DTMR-PT, a GPTD-PT, and a CLAS-PT. Thus, each TN2182 port offers any tone-detection function previously provided by a TN748, TN420, or TN744 Tone Detector board.

The TN2182 also provides either Mu-law or A-law tone detection.

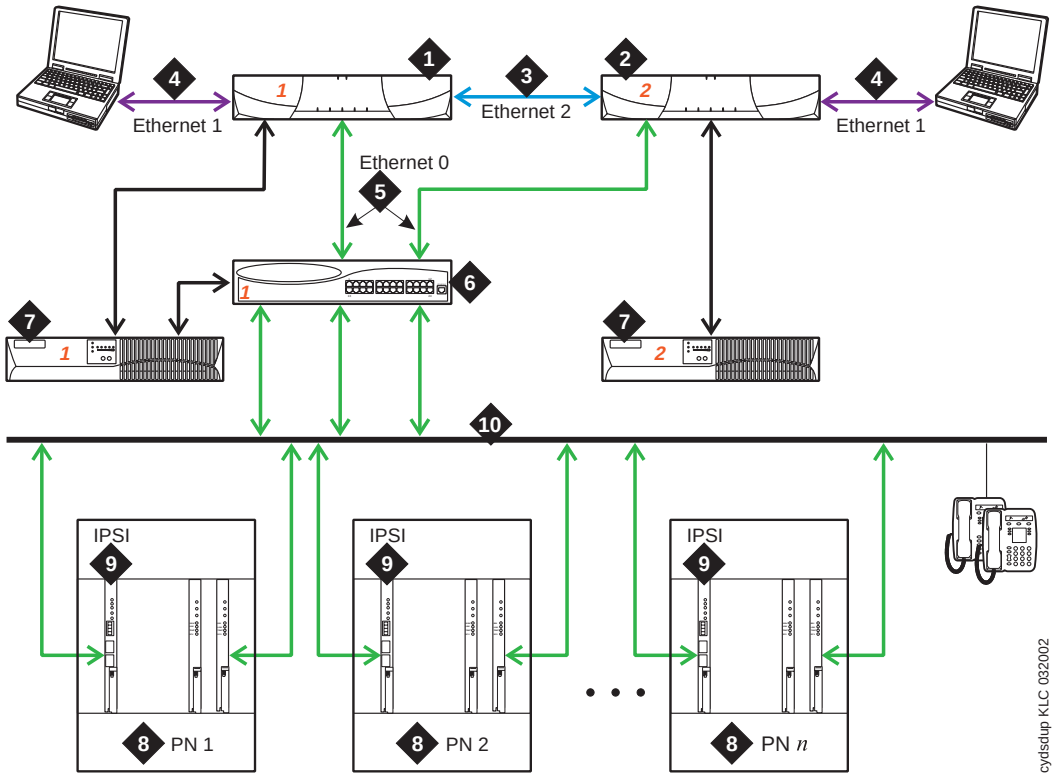
Since the TN2182 also provides Tone-Clock function for non-IPSI port networks, only one (or two if your system is duplicated) TN2182 circuit packs may reside in a PN. If more tone-detection resources are needed, the additional resources must be provided by TN748, TN420, or TN744 circuit packs.

Tone-Clock and the Reliability Configuration

S8700 IP

A Tone Clock circuit resides on each IPSI board. For increased reliability, there is a duplicated server, one in active mode and one on standby. However, there is only one control network and one IPSI per port network as shown in Figure 144. Therefore there is only one Tone Clock circuit per port network.

Figure 144: S8700 IP Connect Duplex Reliability Configuration



For descriptions of components and connections numbered above, see table below.

#	Description of Components and Connections in Figure 144
1	S8700 Media Server 1 - two are always present, one in a active mode and the other on standby.
2	S8700 Media Server 2 - two are always present, one in a active mode and the other on standby.
3	Duplication Interface - The Ethernet connection between the two S8700 Media Servers.
4	Services Interface - The S8700 Media Servers dedicated Ethernet connection to a laptop. This link is active only during on-site administration or maintenance and the services interface can link to the non-active server through a telnet session.

1 of 2

#	Description of Components and Connections in Figure 144
5	Connection from the Servers to the Ethernet Switch.
6	Ethernet Switch - A device that provides for port multiplication by having more than one network segment. In an IP Connect environment, the Ethernet Switch should support 802.1 ip/Q, VLAN and 10/100 mbps.
7	UPS units - two required
8	Port Network - optional configuration of Media Gateways that provides increased switch capacity.
9	IPSI - provides transport of CCMS messages over IP allowing the S8700 Media Server to communicate with the Port Networks.
10	Customer LAN

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S8700 MC

In IPSI-connected port networks, the Tone Clock circuit is found on the IPSI circuit pack. In non-IPSI-connected port networks, there is a Tone Clock circuit pack. The following sections describe the relationship between the various reliability options and the IPSIs or Tone Clock circuits.

S8700 Multi-Connect architecture has three items that can be duplicated: server, IPSI, and PNC. Note that duplicated control networks and duplicated IPSIs go together; when the IPSIs are duplicated, the control networks must be duplicated. While all items can be independently duplicated, the combination of duplicated bearer networks (PNCs) and unduplicated control networks is not allowed. See Table 823.

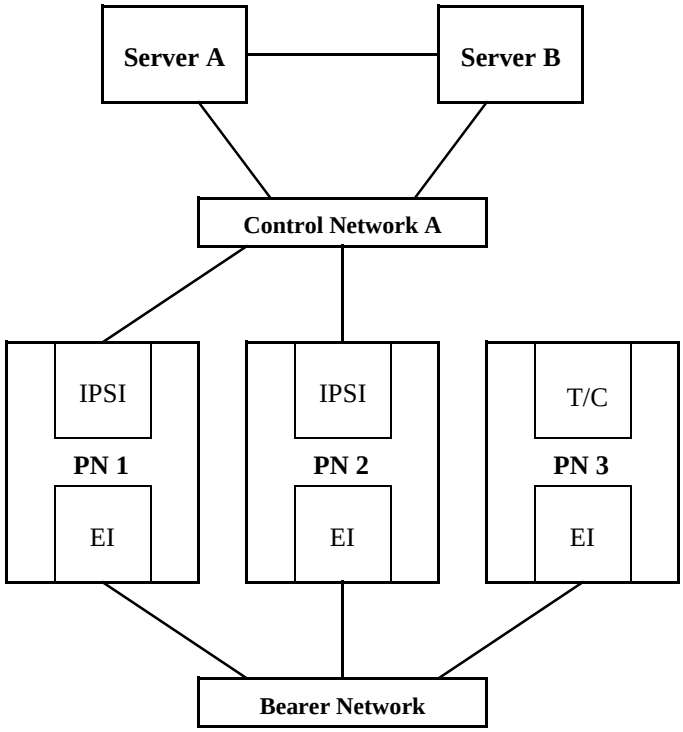
Table 823: S8700 Multi-Connect Reliability Configurations

Configuration	Server	Control Network and IPSI	Bearer Network
Duplex Reliability	Duplicated	Unduplicated	Unduplicated
High Reliability	Duplicated	Duplicated	Unduplicated
Critical Reliability	Duplicated	Duplicated	Duplicated

Duplex-Reliability Configuration

The duplex-reliability configuration shown in Figure 145 has a duplicated server, an unduplicated control network, unduplicated IPSIs in the IPSI-connected port networks, and an unduplicated bearer network. Therefore the Tone Clock is not duplicated in the IPSI-connected port network. In the non-IPSI-connected port network, the Tone Clock boards are also not duplicated.

Figure 145: Duplex-Reliability Configuration



Standard-Reliability Option

Systems with the standard-reliability option (no duplication options) have one Tone-Clock circuit pack in each port network (PPN and EPN). For the PPN or the first EPN of a cabinet this is in the A carrier. Cabinets containing a second EPN will also have a Tone-Clock circuit pack in the E carrier. This Tone-Clock circuit pack generates clocks and provides system tones for every carrier of the port network it resides in.

High-Reliability Configuration

S8700 MC: The high-reliability configuration shown in Figure 146 has a duplicated server, a duplicated control network, and duplicated IPSIs in the IPSI-connected port networks. With this configuration, every IPSI-connected PN must have duplicated IPSIs. The control network is duplicated so that a single fault in the control network, such as a bad Ethernet switch, won't bring the whole system down. The non-IPSI-connected port networks have unduplicated Tone-Clock boards. An EPN's Tone-Clock circuit pack configuration is the same as for the standard-reliability option. Each PN's Tone-Clock circuit is active for both tones and clock signals for its port network.

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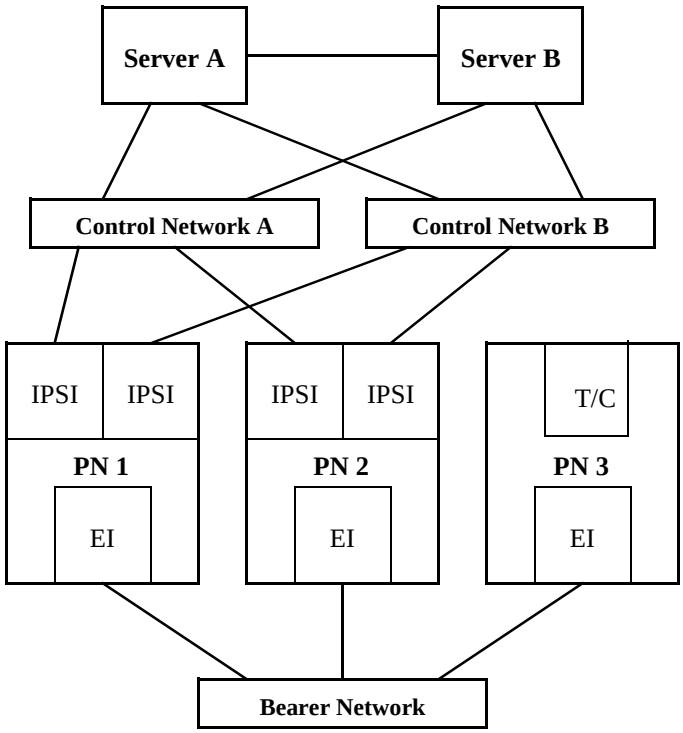
Systems with the High Reliability Option (duplicated SPE, simplex PNC) have one Tone-Clock circuit pack in each PPN control carrier, A and B. One Tone-Clock circuit pack will be actively generating

system clock signals for PPN components, while the other will be in standby mode, ready to take over in the event of a Tone-Clock interchange. Similarly, one Tone-Clock circuit pack will be actively providing system tones for the PPN, while the other will be in standby mode. Normally, the same Tone-Clock circuit pack will be active for both tones and clock signals, but these responsibilities may be divided if neither circuit pack is able to perform both functions. The **status port-network** command will indicate which Tone-Clock circuit pack is actively performing each function.

For systems using the TN2182 Tone-Clock-Detector circuit pack, tone generation and clock generation behaves the same as other clock boards with one being active and one being standby. But the tone detector ports (ETR-PTs) of the TN2182 are always considered available and in-service regardless of the active/standby state of the tones or clock for a specific circuit pack.

EPN Tone-Clock circuit pack configuration is the same as for the Standard Reliability Option. Each EPN Tone-Clock circuit pack will be active for both tones and clock signals for its port network.

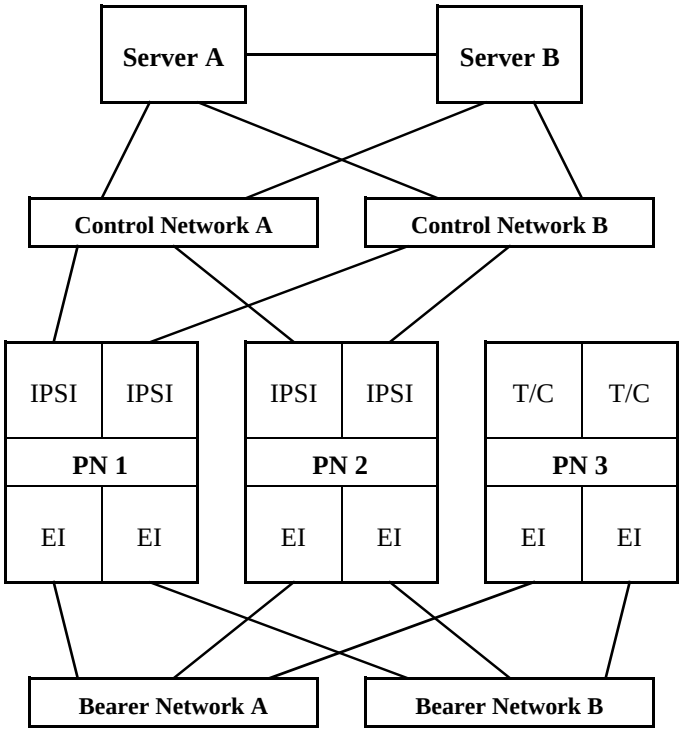
Figure 146: High-Reliability Configuration



Critical-Reliability Configuration

S8700 MC / **S8100**: The critical-reliability configuration shown in Figure 147 has full duplication of the following options: servers, control networks, IPSIs and PNCs (bearer networks). As with the high-reliability configuration, this configuration also requires that IPSI-connected port networks have duplicated IPSIs. This configuration also requires that the non-IPSI-connected port networks have duplicated Tone-Clock boards (either TN2182 or TN780).

Figure 147: Critical-Reliability Configuration



Tone-Clock Interchange Strategy

There are three types of Tone-Clock interchanges:

- Autonomous interchanges initiated as a part of maintenance software strategy for the Tone-Clock or IPSI circuit packs.
- Manual interchanges initiated by **set tone-clock** or **set ipserver-interface**.
- Firmware-initiated Tone-Clock interchanges

Software Instigated Tone-Clock Interchanges

Tone-Clock interchanges may be initiated by software in two ways:

1 A scheduled Tone-Clock or IPSI circuit pack interchange occurs according to the parameters set by **change system-parameters maintenance**. This parameter can be disabled or set to run weekly, the default is for it to occur daily, at a time specified in the system-parameters list for scheduled maintenance to begin. This interchange will be blocked, if the non-preferred Tone-Clock or IPSI circuit pack in a PN has been selected with **set tone-clock** or **set ipserver-interface**. Also if the standby Tone-Clock or IPSI has been set to the busyout state, or if the clock generation capability is known to be impaired. When this scheduled interchange occurs, the standby Tone-Clock or IPSI circuit pack becomes active for twenty seconds to test its ability to generate clock signals. For IPSI scheduled interchanges, the other IPSI modules located on the IPSI circuit pack, i.e. the Packet interface and Archangel are also tested. After testing the IPSI is returned to standby mode.

2 **For Non-IPSI Port Networks**, unscheduled interchanges occur when on-board Tone-Clock circuit-pack maintenance, or ongoing switch maintenance test of the TONE-BD, TONE-PT or the TDM-CLK uncover failures serious enough to raise a MAJOR or MINOR alarm against the active IPSI or Tone-Clock circuit pack.

For IPSI Port Networks, unscheduled IPSI/Tone-Clock interchanges may occur any time as a part of an unscheduled IPSI interchange. The IPSI interchange may be the result of Tone-Clock, PKT-INT, or EAL faults.

S8100

International Settings [G3i V2]

NOTE:
The following information is for **non**-IPSI port networks.

The TN780 Tone-Clock circuit pack uses three firmware configuration parameters for international support [G3i V2]. The following two are automatically set by the software load for the targeted country:

- The circuit pack's country-code (USA, ITALY, AUSTRALIA, etc.)
- The circuit pack's companding mode (mu-Law or A-Law)

The third configuration parameter is used only for Italy (country code: ITALY), and selects whether *new* versus *old* ISPT (Istituto Superiore Poste Telegrafi) tones will be used for dial and confirmation tones. Values for dial confirmation tone can be set independently on the **change system-parameters miscellaneous** form. Whenever such changes are made, the effects are immediately enforced on all TN780 Tone-Clock circuit packs without disrupting tone or timing services.

Tone	Default	Old ISPT Value
Dial	Continuous	Cadenced
Confirmation	Cadenced	Continuous

In addition the TN780 allows customization of up to six system tones in order to meet specific country needs. These changes are made via the **change system-parameters country-options** form.

The TN2182 allows the same International changes as the TN780 but allows the customization of up to 24 system tones in order to meet specific country needs. These changes are made via the **change system-parameters country-options** form.

Manual Tone-Clock Interchange

In an EPN with duplicated Tone-Clock or IPSI circuit packs, one circuit pack is always preferred over the other. For the first port network in a cabinet, this is the Tone-Clock or IPSI circuit pack in carrier **A**. If a second port network is configured in a cabinet, its preferred Tone-Clock or IPSI circuit pack is located in carrier **E**. The intention is that if the preferred Tone-Clock or IPSI circuit pack has been replaced or repaired, the system will make it active by interchanging to it as soon as possible.

In a PPN with more than one Tone-Clock circuit pack, the intention is to assure that the one considered most healthy is active at any given time. *This is independent of the server duplication strategy,* in the sense that the active Tone-Clock circuit pack need not change with an interchange of SPE carriers. Rather, except for the effect of the manual intervention discussed earlier, Tone-Clock interchanges occur

only as a result of changes in the health of Tone-Clock circuit packs, as perceived by maintenance software. When both Tone-Clock circuit packs are equally healthy, no preference is given to one over the other, regardless of which SPE carrier is active.

It is possible to manually control Tone-Clock interchanges in three ways.

1. The **standby** Tone-Clock circuit pack may be made unavailable for most purposes by using the **busyout tone-clock PC** command. Such a Tone-Clock may not be selected with console commands, nor with normal maintenance software activities, until it has been made available again with the **restore tone-clock PC** command.

   NOTE:
   busyout tone-clock is not allowed for active Tone-Clock circuit packs.

2. The SPE processor lock switches may be used to force a particular SPE to be active. *This method overrides all other Tone-Clock interchange controls*. If there is a Tone-Clock circuit pack in the same carrier as the active SPE, it will become active, regardless of its health. If the Tone-Clock circuit pack in the selected SPE was in the *busyout* state (see item 1 above), it will automatically be released and made active. While the lock switches are set for a particular carrier, *no manual intervention or software error detection* will cause an interchange of Tone-Clocks; the Tone-Clock circuit pack in the standby SPE carrier can never become active. If there is no Tone-Clock circuit pack in the selected SPE at the time the switches are set, but one is later installed, the system will interchange to it regardless of its health. If the Tone-Clock circuit pack is removed from an SPE while the switches are set, *no interchange will occur*; the system will have no active tone-clock. When the lock switches are restored to the neutral position, a tone clock interchange will occur only if the standby Tone-Clock circuit pack is healthier than the active one.

3. A particular Tone-Clock circuit pack can be made active by issuing the **set tone-clock PC [override]** command. If the Tone-Clock to be made active is less healthy than the currently active one, no interchange will occur unless the **override** option is specified; without it a message will inform the user that it is required.

   Once a Tone-Clock circuit pack is made active by the **set tone-clock PC** command, it will stay active until either the **set tone-clock PC** command is issued again to make the other circuit pack active, or until a fault occurs in the active Tone-Clock circuit pack, which causes the system to interchange Tone-Clocks.

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Firmware Instigated Tone-Clock Interchanges

Firmware-initiated Tone-Clock interchanges occur when the auto clock switching option is enabled, and the TN2312 IPSI circuit pack firmware detects a loss of clock or clock errors. After detecting a loss of clock/clock errors, and rather than waiting for system software to request a switch, the IPSI firmware will automatically switch the clock (when auto clock switching is enabled). The auto clock switching option is disabled during system restarts.

NOTE:
The auto clock switching option is required by the IPSI circuit pack since the EAL connection to the PKT-INT (one of the IPSI circuit packs many functions) is over the server packet bus which must have a good clock for proper operation.

S8700 MC

Clock Synchronization

NOTE:
Stratum-3 clocking is not available for a port network supported by an IPSI TN2312 circuit pack, or a port network where the Tone-Clock function is supplied by a TN2182.

This section discusses synchronization with a Stratum-3 or -4 clocking device.

Stratum 3

Since the clock module on the TN2312 does not support synchronization with an external Stratum-3 clocking device, you may provide Stratum-3 clocking for a S8700 Media Server system by using the TN780 Tone-Clock circuit pack in a non-IPSI-connected port network. To bring in the external Stratum-3 clocking signals into the TN780, a processor carrier is needed. This new PN control carrier will replace the processor carrier in the old PPN converted to PN 1. The Stratum-3 clocking must come into Port Network #1 because the S8700 Multi-Connect software has the Stratum-3 clocking hard-coded to this port network.

Stratum 4

In G3r, a PPN always resided in the system and was used as a backup synchronization source when either a:

- Synchronization source was not administered
- Designated master and secondary synchronization source failed

With S8700 Multi-Connect, PN 1 (PPN) may or may not exist and thus cannot be relied on as the backup synchronization source. If a S8700 Multi-Connect system does not have an administered synchronization source, it uses the first PN that comes up as its source. If the designated master and secondary synchronization sources fail, the system uses any other PN as its source. No preference is given to PN 1.

Replacing the IPSI or Tone-Clock Circuit Pack

Replacing a TN2312 IPSI circuit pack or Tone-Clock circuit pack is a service-disrupting procedure in a PN with a single Tone-Clock, because the IPSI or Tone-Clock circuit pack is always needed to generate clocks for its PN. When the circuit pack is removed, every call is immediately dropped, the PN enters emergency transfer within one minute, and no calls can be set up from or to that PN.

S8100: However, if the PPN Tone-Clock is removed for replacement in a Standard Reliability Option system, the System Emergency Transfer feature is activated within milliseconds, and the entire system is disrupted; no calls can be placed, and existing calls are dropped.

However, if the PPN Tone-Clock is removed for replacement in a standard-reliability system, the System Emergency Transfer feature is activated within milliseconds, and the entire system is disrupted; no calls can be placed, and existing calls are dropped.

When replacing an IPSI or Tone-Clock circuit pack, always be sure to replace it with the appropriate IPSI or Tone-Clock circuit pack for the system.

S8700

The following circuit-pack code(s) are supported:

S8700 MC: TN768	This is a general-purpose Tone-Clock circuit pack for EPNs. It can be used in every situation, except as the Master Tone-Clock circuit pack when a Stratum-3 clock is administered.
S8700 MC: TN780	The Stratum-3 clock feature requires the use of this circuit pack code in PN 1. The Stratum-3 clock will operate only with this code as the Master Tone-Clock circuit pack. The TN780 circuit pack is upward compatible with the TN768 code, and can be used in any place a TN768 would be allowed. The TN780 is used in many countries outside the U.S. where the TN768 does not provide local tones.
S8700 MC: TN2182	This Tone-Clock-Detector may be used anywhere a TN768 or TN780 is used, with the exception of configurations requiring Stratum-3 clock. The TN2182 may be used in all country configurations.
TN2312	The TN2312 IPSI circuit pack supplies Tone-Clock functionality for S8700 systems.

S8100

System Type	Tone-Clock Circuit Pack Code
One-port network single-carrier cabinet system without High or Critical Reliability.	TN756, TN768, TN780 TN2182 [G3iV4-386]
One-port network system without High or Critical Reliability (multicarrier cabinet).	TN768, TN780
Two-port network single-carrier cabinet system without High or Critical Reliability.	TN768, TN780 TN2182 [G3iV4-386]
One- or two-port network without High or Critical Reliability.	TN768, TN780 TN2182 [G3iV4-386]

Port Networks with a Single Tone-Clock Circuit Pack

This procedure is **destructive**.

1. Pull out the defective IPSI or Tone-Clock circuit pack. This will remove the clocks and cause the system to activate emergency measures. If this is an IPSI supported port network, uUse **busyout ipserver-interface**:
   - All calls to and from the PN will drop, and the PN will activate Emergency Transfer within about one minute. But the rest of the system should operate normally.
   - **S8100**: For the PPN Tone-Clock, the system will immediately go into the Emergency Transfer state.
2. Insert a new IPSI or Tone-Clock circuit pack. The system will detect the return of the clocks and will automatically recover as follows:
   - The system will reset the PN (PN cold restart), and all of the PN's red LEDs will come on and go off within 30 seconds.
   - **S8100**: If the Tone-Clock circuit pack being replaced is in the Processor Port Network, the system will perform a **reset system 2 (system cold 2 restart)** automatically. First, all red LEDs of the PPN will come on and off wi thin 30 seconds. Then, all red LEDs of any Expansion Port Networks will come on and go off within the next 30 seconds.
3. If the red LEDs come on but do not go off within 30 seconds, pull the circuit pack out and reseat it. If the LEDs perform as expected this time, continue with step 6. Otherwise, there may be a problem with the TDM bus; possibly a bent pin in the IPSI or Tone-Clock circuit pack's slot. Follow the directions in the TDM-BUS maintenance section.
4. If the red LEDs did light, as explained above, then go to Step 6. If the red LEDs do NOT light, as explained above, then go on to Step 5.
5. Restart the affected port network:
   - Restart the PN by resetting its Expansion Interface circuit pack via **reset port-network *PN#* level 2**, using the port network's number of the affected PN. (Use the **list cabinet *UU*** command to determine the port network's number for a given cabinet and carrier.)
   - **S8100**: In the PPN, restart the system via the **reset system 2** command.
6. Test the new IPSI or Tone-Clock circuit pack to verify that it is functioning properly, using **test tone-clock *UUC* long**, and verify that the system is operational by placing several phone calls. Where possible, try calls into, out from, and within the affected port network.

Port Networks with Two Tone-Clock Circuit Packs

Notes:

1. Use **list cabinet** to determine the port network's number of the cabinet and carrier containing the Tone-Clock circuit pack to be replaced. If both of a PN's Tone-Clock circuit packs need to be replaced, first replace and test the one in standby mode by either:
   - Entering **status port-network** to display its status
   - Making sure its amber LED is off

   Make sure it is healthy and active before replacing the second one.

S8100

The active/standby state of a Tone-Clock circuit pack may also be determined by looking at its LED. A continuously lit red LED on the Tone-Clock circuit pack indicates a reported fault on one or more of the maintenance objects on the circuit pack. Flashing patterns of the yellow and green LEDs correspond to the following service states: **Tone-Clock LED Flashing Codes**

Condition	Tone-Clock Circuit State	Explanation
“flashing yellow” 2.7 seconds on,.3 seconds off	active	An external timing source is being used as a synchronization reference.[1]
“flashing yellow”.3 seconds on, 2.7 seconds off	active	The local oscillator on the Tone-Clock circuit pack is being used as a synchronization reference.
"yellow" on continuously	active	The circuit pack has been reset but has not been told which synchronization source to use.
"yellow" LED off	standby	The circuit pack is in standby mode, (neither generating tones nor supplying clocks).
“jingle bells” green and yellow.1 sec on,.2 sec off,.1 sec on,.4 sec off,.4 sec on,.4 sec off	standby	Maintenance software is testing the standby circuit pack (the standby Tone-Clock is providing tones).
“double blink yellow”.3 sec on,. 3 sec off,.3 sec on, 2.4 sec off	active	TN2182 has lost all external references and is in holdover mode.
"other green and yellow patterns"	active	Maintenance software is testing the active circuit pack.
random yellow	standby	If the circuit pack is a TN2182, the yellow LED may come on and off intermittently as ETR-PTs on the board are used for tone detection services.

1 For a Tone-Clock in the master port network, the external source is the primary or secondary DS1 source, or a Stratum 3 clock. For a Tone-Clock in a slave port network, the external source is the Expansion Interface circuit pack.

2 If the Tone-Clock circuit pack to be replaced is active, then switch to the other Tone-Clock circuit pack by doing the following:

- **set tone-clock *UUC*** — Where UUC is the standby Tone-Clock circuit pack.

  NOTE:
  For a critical-reliability system (duplicated PNC), the system generally expects a PN to have its “preferred” Tone-Clock circuit pack active. For the first PN in a given cabinet, this is carrier A. For a second PN in the cabinet, this is carrier E.

- **status system** — Verify the Tone-Clock circuit pack switched to the other Tone-Clock circuit pack or check the LEDs. The amber LED of the new standby Tone-Clock circuit pack should be off (provided maintenance is not running on it) and the amber LED of the active Tone-Clock circuit pack should be blinking.
- If the interchange was not successful, the standby Tone-Clock circuit pack may be defective. In particular, if the error message `must use override` is displayed, fix the standby Tone-Clock circuit pack before attempting to replace the active one.

3 **S8100**: If the Tone-Clock circuit pack to be replaced is in the PPN, it is recommended, but not required, that the SPE carrier containing it be locked in standby mode by executing an interchange if necessary, and locking the SPE-Select switches. This protects you from disrupting service in case of inadvertent errors in replacing the circuit pack.

NOTE:
If the SPE-Select switches are locked, be sure to release them at the conclusion of the replacement procedure.

4 Pull out the defective Tone-Clock circuit pack. No calls should be affected. If this is a TN2182 circuit pack, some ETR-PTs may be in use and removal of the pack will affect some individual users. It may be less disruptive to busyout the standby TN2182 before removing it.

5 Insert a new Tone-Clock circuit pack of the appropriate code in the same slot where the defective Tone-Clock circuit pack was removed.

6 Test the new Tone-Clock circuit pack via **test tone-clock *UUC* long** to make sure it is functioning properly. If the Tone-Clock circuit pack is being replaced due to loss of clocks, the Clock Health Inquiry (#46) will still report a failure, proceed with the next step.

7 To verify that the new Tone-Clock circuit pack can generate clocks for the system, switch to the new Tone-Clock with **set tone-clock *UUC* override**, and execute **test tone-clock *UUC***. (**S8100**: In a PPN, the SPE-Select switches must be in the auto position.) If the new Tone-Clock circuit pack is able to generate system clocks, there will be no system disruption.

CAUTION:
If the new Tone-Clock circuit pack is not able to generate system clocks, this procedure becomes destructive. The system will detect a loss of clock and recover by resetting the PN (PN cold restart). **S8100**: If the Tone-Clock circuit pack being replaced is in an EPN, the system will reset the EPN (EPN cold restart).

After the restart, the faulty Tone-Clock circuit pack will be in standby mode.

8 Place several phone calls.

9 **S8100**: After replacing a Tone-Clock circuit pack in an SPE, if the SPE lock switches were set during the procedure, they should be released. Then, use **set tone-clock *UUC***, if necessary, to make the preferred Tone-Clock circuit pack active.

IPSI/Tone Clock LED States

For the TN2312 IPSI circuit pack, there are four LEDs on the IPSI's faceplate. The top three LEDs are the standard ones found on any TN circuit pack. The fourth LED imitates the TN2182B Tone-Clock's amber LED. The active/standby state of an IPSI or Tone-Clock circuit pack may also be determined by

looking at its LEDs. A continuously lit red LED on the circuit pack indicates a reported fault on one or more of its MOs. Flashing patterns of the yellow and green LEDs correspond to the following service states:

Table 824: LED Condition/Tone-Clock Circuit States

Condition	Tone-Clock Circuit State	Explanation
flashing yellow 2.7 seconds on 0.3 seconds off	active	An external timing source is being used as a synchronization reference[1].
flashing yellow 0.3 seconds on 2.7 seconds off	active	The local oscillator on the IPSI or Tone-Clock circuit pack is being used as a synchronization reference.
yellow on continuously	active	The circuit pack has been reset but has not been told which synchronization source to use.
S8700 MC: yellow LED off	standby	The circuit pack is in standby mode, (neither generating tones nor supplying clocks).
S8700 MC: “jingle bells” green and yellow 0.1 sec on, 0.2 sec off, 0.1 sec on, 0.4 sec off, 0.4 sec on, 0.4 sec off	standby	Maintenance software is testing the standby circuit pack (the standby Tone-Clock is providing tones).
“double blink” yellow 0.3 sec on, 0.3 sec off, 0.3 sec on, 2.4 sec off,	active	TN2312 or TN2182 has lost all external references and is in holdover mode.
other green and yellow patterns	active	Maintenance software is testing the active circuit pack.
S8700 MC: random yellow	standby	If the circuit pack is a TN2182, the amber LED may come on and off intermittently as ETR-PTs on the board are used for tone-detection services.

1 For a Tone-Clock in the master PN, the external source is a primary or secondary DS1 source, or a Stratum-3 clock. For a Tone-Clock in a slave PN, the external source is the Expansion Interface circuit pack.

Error Log Entries and Test to Clear Values

Table 825: Tone-Clock Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test tone-clock** *PC* **sh**
1 (a)	0	Circuit pack removed or SAKI Sanity test (#53)	MINOR	ON	
18 (b)	0	**busyout tone-clock** *PC*	WARNING	OFF	**release tone-clock** *PC*
23 (c) (b)	0	None	WARNING	OFF	
125 (d) (c)		None	MINOR	ON	
126 (e) (d)		None	MINOR	ON	
257 (f) (e)	65535	Control Channel test (#52)	MINOR	ON	**test tone-clock** *PC* **r 20**
257 (f) (e)	Any	None			
513 (g) (f)	Any	None			
769 (h) (g)	4358	None			
1025 (i) (h)	4363	NPE Audit test (50)			**test tone-clock** *PC* **sh**
1538 (j) (i)	Any	None	MINOR	ON	
2049 (k) (j)	0	Clock Health Inquiry test (#46)	MAJOR	ON	**set tone-clock** *UC* **override**[3]
2305 (k) (j)	0	Clock Health Inquiry test (#46)	MAJOR	ON	**set tone-clock** *UC* **override**[3]
2561 (l) (k)	Any	None	MAJOR	ON	
3329 (m) (l)	0	None	MINOR/ WARNING[2]	OFF	**set tone-clock** *UC* **override**[3]
3840 (n) (m)	Any	None			
3848 (o)(n)	0	Clock Health Inquiry test (#46)			**set tone-clock** *UC* **override**[3]
3856 (p) (o)			MAJOR	ON	**set tone-clock** *UC* **override**[3]

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Table 825: Tone-Clock Circuit Pack Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3857 3858 (q) (p)		NONE	MAJOR	ON	**busyout/release ipserver-interface**
3872 (r) (q)	0	None			**set tone-clock** *UC* **override**[3]
3999 (s) (r)	Any	None			

2 of 2

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 Minor alarms on this MO may be downgraded to Warning based on the value in **set options**.

For a TN2312 IPSI-supported port network, use the command **set ipserver-interface**.

Error Notes:

a **Error Type 1** — This error indicates the circuit pack totally stopped functioning or it was physically removed from the system.

NOTE:
The alarm is logged approximately 11 minutes after the circuit pack is removed/SAKI Sanity test (#53) fails.

If the circuit pack is not present in the system, insert a circuit pack in the slot indicated by the error to resolve the error.

If the circuit pack is present in the system, it is faulty and must be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

If the faulty circuit pack is in standby mode, a MINOR alarm is raised, but no other system action is taken. If the circuit pack is the active Tone-Clock, further effects of this error depend on the system's reliability option.

Table 826: Effects of Tone-Clock Failures Depending on Reliability

Reliability Option	Effects
Standard	EPN goes down
S8100: Standard Duplex High	PPN: System Emergency Transfer (entire system affected) EPN: Emergency Transfer in the affected EPN PN goes down. IPSI interchange in IPSI-connected PN Non-IPSI-connected PN goes down
S8100: High	PPN: Interchange to standby Tone-Clock in PPN EPN: Emergancy Transfer in the affected EPN
Critical	IPSI interchange in IPSI-connected PN Interchange to standby Tone-Clock circuit pack in non-IPSI-connected PN
S8100: Critical	PPN: Interchange to standby Tone-Clock in the PPN EPN: Interchange to standby Tone-Clock in the affected EPN.

If an interchange is attempted in an MCC PN ***and*** the system is unable to activate the standby Tone-Clock, Emergency Transfer is activated. When this happens, both circuit packs are faulty and must be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

If a successful interchange occurs in response to a failure of the active Tone-Clock ***or*** if a standby Tone-Clock fails, the faulty Tone-Clock should be replaced.

b **Error Type 18** — The indicated IPSI or Tone-Clock circuit pack has been made unavailable by **busyout tone-clock *PC*** or **busyout ipserver-interface *UC***. This error applies only to high- or critical-reliability systems (an active Tone-Clock may not be busied out). To resolve this error, execute **release tone-clock PC**, or **release ipserver-interface**.

c **Error Type 23** — The circuit pack has been logically administered but not physically installed. Installing the circuit pack will resolve the alarm.

d **Error Type 125** — A wrong circuit pack is inserted in the slot where this circuit pack is logically administered. To resolve this problem, either:

1 Remove the wrong circuit pack, and insert the logically administered circuit pack.

or

Use the **change circuit-pack** command to re-administer this slot to match the circuit pack inserted.

e **Error Type 126** — The port network specified in the PORT field of the error log entry booted up without a Tone-Clock circuit pack, or with a one that cannot communicate at all with the system. The error is logged five minutes after the port network is restarted. If no circuit pack is present, install one of the proper code. If there is a circuit pack present, replace it. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

f **Error Type 257** — This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

g **Error Type 513** — This circuit pack has an on-board hardware failure. Replace the circuit pack using the procedure described in Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

h **Error Type 769** — This error can be ignored, but look for other errors on this circuit pack.

i **Error Type 1025** — This error is not service-affecting, and no action is required.

j **Error Type 1538** — The circuit pack was taken out of service because of an excessive rate of uplink messages. Use **test tone-clock *PC* long** to reset the circuit pack and put it back into service. If the command is not successful, replace the circuit pack using the procedure described in Replacing the IPSI or Tone-Clock Circuit Pack on page 1911. If the alarmed circuit pack is the active Tone-Clock of a duplicated pair, first interchange Tone-Clocks via **set tone-clock *PC*** to avoid a service outage. If the error occurs again within 15 minutes, follow normal escalation procedures.

k **Error Type 2049 or 2305** — These errors indicate the loss of one or more clock signals from the reported IPSI or Tone-Clock circuit pack, which was active at the time of the error. The effect of any of these errors is described in the table for error type 1. Diagnosis of the problem is the same for all four error types, with the exception noted below.

1 Examine the Hardware Error Log for errors reported against circuit packs in the same port network, especially TDM-CLK, TONE-BD, (**S8100**: DUPINT, SW-CTL), and EXP-INTF. Follow the repair or replacement procedures indicated for any such errors found.

2 If the error is not corrected by resolving errors found in step 1, the IPSI or Tone-Clock circuit pack should be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

NOTE:
Replacing the circuit pack and retesting it with **test tone-clock** is not adequate to retire this alarm and return the IPSI or Tone-Clock circuit pack to full service; the Clock Health Inquiry test (#46) will continue to fail. Because the ability to generate clocks was considered lost, once any repairs have been made it is necessary to execute **set tone-clock *PC* override**, forcing the circuit pack to become active. If the problem was not corrected, this action may cause a disruption in service for active digital facilities users.

3 If error **2305** or **3848** persists, all clock signals from the indicated board were lost.

If the reported Tone-Clock circuit is in a port network with duplicated Tone-Clocks, the problem may lie with the circuit pack responsible for selecting the active Tone-Clock circuit (the *t/c selector*). The t/c selector is the active EXP-INTF circuit pack.

- **S8100**: For a PPN, the t/c selector is the DUPINT circuit pack on carrier A.
- **S8100**: For an EPN, the t/c selector is the active EXP-INTF circuit pack that is connected to the PPN. This is EXP-INTF 2A01 or 2B02 for EPN1 and 3A01 or 3B02 for EPN2.

The t/c selector circuit pack of interest is the one which was active at the time the error was logged. This is the currently active t/c selector, unless there has been an EXP-INTF link switch. In order to determine whether an interchange has occurred since the TONE-BD error, examine the **display initcauses** log for EXP-LNK entries in the hardware error log for expansion link interchanges.

If the t/c selector circuit pack was not replaced as part of the previous step, replace it now. Follow procedures described in EXP-INTF (Expansion Interface Circuit Pack) on page 911 for the Expansion Interface, or Reseating and replacing circuit packs in *Maintenance Procedures (555-245-103)*.

4 If the error has not been corrected at this point, there is a problem with the TDM bus within the port network containing the reported Tone-Clock circuit. This may include TDM bus intercarrier cables, bus terminators, bent pins on the backplane, and errors on any circuit pack plugged into the same port network. See TDM-BUS (TDM Bus) on page 1832.

l **Error Type 2561**—This error indicates that a Tone-Clock circuit pack, with a different circuit-pack code as required for this system, has been inserted in the port slot as shown in the Hardware Error Log. To resolve this error, see Replacing the IPSI or Tone-Clock Circuit Pack on page 1911 for an appropriate circuit pack code and replace the Tone-Clock circuit pack according to the procedures indicated for this system. The meanings of the aux data values are as follows:

S8100: 1001	A TN756 Tone-Clock circuit pack is in the PPN of a one port network system without High or Critical Reliability (Multicarrier Cabinet).
S8100: 1002	A TN756 Tone-Clock circuit pack is in the EPN of a one port network system without High or Critical Reliability (Multicarrier Cabinet).
1002	A TN756 Tone-Clock circuit pack (instead of a TN2312) is in a standard- or duplex-reliability system's PN.
S8100: 1003	Either a TN741 or TN714 Tone-Clock circuit pack (instead of a TN768, TN780 or TN2182) is in a one port network system without High or Critical Reliability (Multicarrier Cabinet).
1003	Either a TN741, TN714, TN768, TN780, or TN2182 Tone-Clock circuit pack (instead of a TN2312 IPSI) is in a standard- or duplex-reliability system's PN.
1004	Either a TN741 or TN714 Tone-Clock circuit pack (instead of a TN768, TN780, TN2182, or TN2312) is in a high- or critical-reliability system's PN.
1005	Same as for aux value 1004.

m **Error Type 3329**—The system attempted but failed to interchange IPSI or Tone-Clock circuit packs. (This error occurs only in port networks with duplicated Tone-Clocks.) The fault may lie in the standby Tone-Clock or in the circuit pack that controls selection of the active Tone-Clock (the *t/c selector*). The goal of the following procedure is to ensure that both Tone-Clocks can be interchanged to while either t/c-selector circuit pack is active.

1 Examine the Error Log for errors reported against circuit packs in the same port network, paying special attention to TDM-CLK, TONE-BD, DUPINT, SW-CTL, and EXP-INTF. Follow the procedures indicated for any such errors found. After eliminating the above potential problem sources, proceed with the following steps.

2 Determine which circuit pack was controlling the choice of Tone-Clock at the time the error occurred.

- **S8100**: For a PPN, the t/c selector is the DUPINT circuit pack on the A-carrier.
- (**S8100**: For an EPN) The t/c selector is the active EXP-INTF circuit pack that is connected to the active PN. This is EXP-INTF 2A01 or 2B02 for EPN1 and 3A01 or 3B02 for EPN2.

The t/c-selector circuit pack of interest is the one which was active at the time the error was logged. An EXP-LNK interchange since the time of the error may have made that circuit pack the current standby. Determine whether an interchange affecting the t/c selector has occurred since the TONE-BD error. Look for EXP-LNK entries in the hardware error log for PNC interchanges, which would affect the EXP-INTF.

3 If the t/c selector has not undergone an interchange since the error occurred, go to the next step. If such an interchange has taken place, interchange back to the formerly active t/c selector. Use **set expansion-interface**. If the interchange attempt fails due to other errors, resolve those problems first.

4 Interchange the IPSI or Tone-Clock circuits, using **set tone-clock *PC***. If the command succeeds, the interchange that previously failed has been accomplished and the problem has been satisfactorily resolved. If it fails, proceed to the next step. You may want to proceed in any case to definitively test all relevant components.

5 Interchange the t/c selector using **set expansion-interface** (**S8100**: if investigating an EPN). If errors prevent this interchange, resolve them first.

6 Attempt again to interchange Tone-Clocks with **set tone-clock *PC***.

If the Tone-Clock interchange failed for both t/c selectors, replace the standby Tone-Clock circuit pack which could not be interchanged into and return to this step. (See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.) Test the new circuit pack as follows:

a Execute **set tone-clock *PC***.

b Execute **set expansion-interface** (**S8100**: if this is an EPN Tone-Clock).

c Execute the **set tone-clock PC** command again.

If these commands successfully complete, the problem has been resolved.

If these commands successfully complete, the problem has been resolved.

If the IPSI or Tone-Clock circuit packs successfully interchange when one EXP-INTF is active, but not when the other one is, the t/c-selector circuit pack on the failing side is suspect.

a Replace the EXP-INTF board (**S8100**: or A carrier DUPINT board) that is active when the Tone-Clock interchange fails. For the Expansion Interface, see EXP-INTF (Expansion Interface Circuit Pack) on page 911. Follow procedures in Reseating and replacing circuit packs in Maintenance Procedures (555-245-103), and “Reliability Systems: A Maintenance Aid” for the DUPINT circuit pack

b Make sure the new t/c selector is active and execute **set tone-clock *PC***.

c If both Tone-Clocks can be interchanged into, and interchanges succeed when either t/c selector is active, the problem has been resolved.

n **Error Type 3840** — This error is not service-affecting and can be ignored. It indicates that the circuit pack has received a bad control message from the switch.

o **Error Type 3848 —** This error indicates that the IPSI or Tone-Clock circuit pack had a loss of clock. If error 2305 is also logged, see Note k.

p **Error Type 3856 —** This error indicates that the IPSI or Tone-Clock circuit pack had a loss of clock. If error 2305 is also logged, see the note for Error Type 2305, k.

q **Error Type 3857, 3858 —** These errors are reported by software when an uplink message is received from the active IPSI’s Archangel firmware. Both error types indicate that a loss of one or more clock signals were detected by the archangel, and subsequently restored by changing the CLKSEL lead[1]. If the IPSI archangel restores the clock signals by activating the [A] IPSI/Tone-Clock, then error type 3857 is reported. If the clock signals are restored by activating the [B] IPSI/Tone-Clock, then error type 3858 is reported. A Cold 2 Restart should occur in a port network immediately after error type 3857 or 3858 is reported.

1 Whenever, the active archangel detects a loss of clock, it will alternate the state of the CLKSEL lead until the lost clock signals are restored.

Duplex Reliability — Since there is only one IPSI in the port network, error type 3858 can never occur. When error type 3857 occurs, it means the [A] IPSI archangel experienced a loss of clock, but clocking was subsequently restored using the [A] IPSI/Tone-Clock.

High or Critical Reliability — If the [B] IPSI is active and the [A] IPSI is healthy when error type 3857 is reported, then software attempts to initiate an IPSI interchange to activate the archangel and PKT-INT on the [A] IPSI, thereby ensuring that the active Tone-Clock, PKT-INT, and archangel are all on the same IPSI. If the [A] IPSI is unhealthy, then software initiates a transition to EI-Fallback mode. If the [A] IPSI is active when error type 3857 is reported, it means the archangel for the [A] IPSI had to switch the state of the CLKSEL lead more than once to restore the lost clock signals.

When error type 3858 is reported, if the [A] IPSI is active and the [B] IPSI is healthy, then software attempts to initiate an IPSI interchange to activate the archangel and PKT-INT on the [B] IPSI. If the [B] IPSI is unhealthy, then software initiates a transition to EI-Fallback mode. If the [B] IPSI is active when error type 3858 is reported, it means the archangel for the [B] IPSI had to switch the state of the CLKSEL lead more than once to restore the lost clock signals.

For the high and critical reliability configurations, error type 2305 should be logged against MO_TGEN_BD for the standby IPSI/Tone-Clock after error type 3857 or 3858 is reported.

r **Error Type 3872 —** These errors indicates that an IPSI or Tone-Clock circuit pack had a loss of Data Clocks. This error will impact mainly users on station connected to Digital circuit packs. These users could be with out service. If error 2049 is also logged see Note k.

s **Error type 3999 —** This error type indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If error type 1538 is also present, then the circuit pack was taken out of service due to hyperactivity. If error type 1538 is not present, then the circuit pack has not been taken out of service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below. By clearing error codes associated with the SAKI Reset test, you may clear errors generated from other tests in the sequence.

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For a system with a TN756 Tone-Clock circuit pack

Table 827: TONE-BD System Technician-Demanded Tests (for TN756 Tone-Clock Circuit Pack)

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
SAKI Sanity Test (#53) (a)		X	D
Clock Health Inquiry Test (#46)	X	X	ND
Control Channel Loop Around Test (#52) (a)	X	X	ND
Tone Detection Verification Test (#42) (b)	X	X	ND
Tone Detection Audit/Update Test (#43) (b)	X	X	ND
Tone Generator Crosstalk Test (#90) (b)		X	ND
Tone Generator Transmission Test (#40) (b)	X	X	ND
Tone Generator Audit/Update (#41) (b)	X	X	ND

1 D = Destructive; ND = Nondestructive

Notes:

a Refer to XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for descriptions of these tests.

b Refer to TONE-PT (Tone Generator) on page 1927 for descriptions of these tests.

For a system with a TN768, TN780, orTN2182 circuit pack

Table 828: TONE-BD System Technician-Demanded Tests (for TN768, TN780, or TN2182 Tone-Clock Circuit Pack)

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
SAKI Sanity test (#53) (a)		X		D
Clock Health test (#46)	X	X		ND
Control Channel Loop-Around test (#52) (a)	X	X		ND
Tone Generator Crosstalk test (#90) (b)		X		ND
Tone Generator Transmission test (#40) (b)	X	X		ND
Tone Generator Audit/Update test (#41) (b)	X	X		ND

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Table 828: TONE-BD System Technician-Demanded Tests (for TN768, TN780, or TN2182 Tone-Clock Circuit Pack)

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Tone Detector Verification test (#42) (e)	X	X		ND
Tone Detector Audit/Update test (#43) (e)	X	X		ND
TDM Bus Clock Circuit Status Inquiry test (#148) (c)	X	X		ND
TDM Bus Clock Slip Inquiry test (#149) (c, e, d)	X	X		ND
TDM Bus Clock PPM Inquiry test (#150) (c)	X	X		ND
TDM Bus Clock Parameter Update test (#151) (c)	X	X		ND
Board Type Check test (#574) (c)	X	X		ND
Standby Reference Health Check test (#651) (c, d)		X		ND

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1 D = Destructive; ND = Nondestructive

Notes:

a See "XXX-BD (Common Port Circuit Pack/Media Module)" on page 2086 for descriptions of these tests.

b See "TONE-PT (Tone Generator)" on page 1927 for descriptions of these tests.

c See "TDM-CLK (TDM Bus Clock)" on page 1847 for descriptions of these tests.

d This test runs only on the standby IPSI or Tone-Clock circuit in a port network with duplicated Tone-Clocks (high- or critical-reliability systems). The circuit pack must be a TN780 with firmware version 2 or above.

e See ETR-PT (Enhanced Tone Receiver Port) on page 904 for test description.

Clock Health Inquiry Test (#46)

This inquiry reads special data stored in memory to determine if this IPSI or Tone-Clock circuit pack had a loss of any of three clock types:

- SYSCLK
- SYSFM
- SYSDCLK

If this data indicates this IPSI or Tone-Clock circuit pack had a loss of any of these clocks, the inquiry reports FAIL. In addition, if TDM-CLK error 1 is at threshold, this test will FAIL. TDM-CLK error 1 indicates a suspect clock is at the edge of its specified frequency. If the circuit pack did not have a loss of clock or TDM-CLK error 1 at threshold, the inquiry reports PASS.

This is not really a test, in the sense that it simply reports status held by the system, and does not generate new information or raise alarms. If this test fails with no error code, there is at least one Major alarm against an IPSI or Tone-Clock circuit pack. If this test fails with an error code of 1, there is at least one Minor off-board alarm against a TDM-CLK.

Table 829: Test #46 Clock Health Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. Retry the command at 11-minute intervals up to 5 times.
none	FAIL	This Tone-Clock or IPSI circuit pack had an apparent loss of clock. One or more of error types 2049, 2305, 3834, 3857, 3858 and 3872 will appear in the error log. Correct the problem according to the appropriate error log entries. ***Tone -Clock circuit pack*** – If this test fails for a Tone-Clock circuit pack, the only way to make it pass, and to retire its associated alarm, is to repair the problem and to execute **set tone-clock UUC override** against the indicated or Tone-Clock circuit pack. ***IPSI's Tone-Clock circuit*** – If this test fails for an IPSI circuit pack's Tone-Clock circuit, the only way to make it pass, and to retire the associated alarm, is to repair the problem, and to execute **busy ipserver-interface**, then issue **release ipserver-interface** against the indicated IPSI circuit pack. **S8100**: If power is removed from a carrier in a duplicated system, and that SPE has the active TONE-CLK, a MAJOR alarm is raised for the TONE-BD. The TONE-BD will be out of service and when running Test 46 (Clock Health Test) it will fail, indicating a loss of any of these three clocks, SYSCLK, SYSFM, and SYSDCLK. To restore the TONE-BD to service you must execute the **set tone spe health-override** command.
1	FAIL	This IPSI or Tone-Clock circuit pack is suspected of having a clock at the edge of its specified frequency. A Tone-Clock circuit pack with this problem can cause Expansion Interface circuit packs and SNI circuit packs to go out-of-frame or report no neighbor conditions, thus causing EPNs, Expansion Archangel Links (EALs), Remote Neighbor Links (RNLs), and/or Local Neighbor Links LNLs) to go down. **1** Replace the IPSI or Tone-Clock circuit pack identified in the error log. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.
	PASS	This IPSI or Tone-Clock circuit pack has not reported a loss of clock.

TONE-PT (Tone Generator)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
TONE-PT	MAJOR	**test tone-clock *location* sh**	Tone Generator
TONE-PT	MINOR	**test tone-clock *location* sh**	Tone Generator
TONE-PT	WARNING	**release tone-clock *location***	Tone Generator

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
Replacing the IPSI or Tone-Clock circuit pack requires a special procedure which is described in TONE-BD (Tone-Clock Circuit) on page 1902. That section also describes the LED display for this board.

The tone generator resides on the IPSI or Tone-Clock circuit pack (**S8100**: TN2314 Processor/Tone-Clock circuit pack) and provides all system tones such as dial tone, busy tone, and so on. If an active tone generator fails, its port network may not have tones (see the Tone Generator Transmission Test (#40) on page 1930. For instance, a user may go off-hook and hear no dial tone. This problem will affect only users on the same port network where the faulty IPSI or Tone-Clock circuit pack resides. The system will be able to process certain type of calls (that is, internal calls will succeed while outgoing calls will not).

The IPSI or Tone-Clock circuit pack (**S8100**: TN2314 Processor/Tone-Clock circuit pack) also provides the clocks for the system and can serve as the synchronization reference. Therefore, when resolving alarms, use the "TDM-CLK (TDM Bus Clock)", SYNC (Port-Network Synchronization) on page 1751, "TONE-BD (Tone-Clock Circuit)", and PR-TN-BD (TN2314 Processor/Tone-Clock) on page 1545 maintenance documentation.

See TONE-BD (Tone-Clock Circuit) on page 1902 for a discussion of the relationship of Tone-Clock circuit packs with the various reliability options.

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When replacing the Tone Clock (as part of the TN2314 Processor circuit pack), always follow the procedures for replacing the TN2314 Processor circuit pack.

WARNING:
When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.

Error Log Entries and Test to Clear Values

Table 830: Tone Generator Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test tone-clock** *UUC* **r 1**
1 (a)	17664	Tone Generator Audit/ Update test (#41)	MAJOR/ MINOR[2]	ON	**test tone-clock** *UUC* **r 2**
18 (b)	0	**busyout tone-clock** *UUC*	WARNING	OFF	**release tone-clock** *UUC*
130 (c) **S8700 IP**: (b)		None	MINOR	ON	**test tone-clock** *UUC* **Sh**
257 (d, f) **S8700 IP**: (c, e)	17667	None	MINOR	ON	
513 (e, f) **S8700 IP**: (d, e)	17666	Tone Generator Audit/ Update test (#41)	MINOR	ON	**test tone-clock** *UUC* **r 3**
769 **S8100**: (i)	Any	Transmission test (#40)	MAJOR/ MINOR[2]	ON	**test tone-clock** *UUC* **r 3**
1025 **S8100**: (h)		Crosstalk test (#90)	MAJOR/ MINOR[2]	ON	**test tone-clock** *UUC* **l r 2**
1281 (g) **S8700 IP**: (f)	Any	Tone Generator Audit/ Update test (#41)	MINOR	ON	**test tone-clock** *UUC* **r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 MAJOR alarm if the alarmed IPSI or Tone-Clock circuit pack is not duplicated; MINOR if it is duplicated within the same PN.

Notes:

a A failure in the tone generation facility on the indicated circuit pack has been detected. Replace the circuit pack. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

WARNING:

S8100: When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.

b The indicated IPSI or Tone-Clock circuit pack has been made unavailable via **busyout tone-clock *UUC***. It only applies to systems which have the high- or critical-reliability option administered, because only a standby Tone-Clock circuit may be made busy by that command. To resolve this error, execute **release tone-clock *UUC*** for the alarmed circuit pack.

c This error type indicates that the circuit pack has been removed or has been insane for more than 11-minutes. To clear the error, reinsert or replace the circuit pack.

d The tone generation facility is having problems verifying that tones have been connected as requested.

e **S8700 IP**: The tone generation facility may or may not be able to generate tones.

f Infrequent errors, at a rate which does not bring up an alarm, probably do not affect service, unless there are customer complaints of no tones, or incorrect tones which can not be explained in any other way. However, if an alarm is raised because this error is being repeatedly logged, then the circuit pack should be replaced. See Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

g The system-parameters country-options administration requires a TN780 or TN2182 Tone-Clock, a TN2312 IPSI circuit pack, (**S8100**: or a TN2314 circuit pack), but the existing Tone-Clock circuit does not provide the needed functionality. The Base Tone Generation Set on page 1 or the custom tones beginning on page 2 of the system-parameters country options screen may have values not supported by the existing Tone-Clock.

This error (1281) indicates that the system parameters country-options screen has custom tones translated and that the alarmed tone board does not support the customized tones. TN768 tone boards do not support any customized tones. TN780 tone boards support up to 6 customized tones using the following frequencies/levels only:

Silence	404Hz at 11.0 dB
350Hz at 17.25 dB	404Hz at 16.0 dB
425Hz at 4.0 dB	480Hz+620Hz at 24.0 dB
425Hz at 11.0 dB	404Hz+425Hz at 11.0 dB
425Hz at 17.25 dB	375Hz+425Hz at 15.0 dB
440Hz at 17.25 dB	404Hz+450Hz at 11.0 dB
350Hz+425Hz at 4.0 dB	1000Hz at 0.0 dB
350Hz+440Hz at 13.75 dB	1000Hz at +3.0 dB
480Hz at 17.25 dB	525Hz at 11.0 dB
620Hz at 17.25 dB	1400Hz at 11.0 dB
440Hz+480Hz at 19.0 dB	

h **S8100**: Error Type: 1025 - Timeslot Crosstalk Test failure. If a tone applied to one timeslot is inaudible, or is audible on another, it is reported by incrementing this counter and a MAJOR alarm is raised. Replace the TN2314 Processor/Tone-Clock circuit pack.

i **S8100**: Error Type: 769 - Infrequent errors, at a rate which does not bring up an alarm, probably do not affect service, unless there are customer complaints of no tones, or incorrect tones which cannot be explained in any other way. However, if an alarm is raised because this error is being repeatedly logged, then the circuit pack should be replaced.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below when inspecting errors in the system. By clearing error codes associated with the SAKI Reset test for example, you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
SAKI Reset test (#53) (a)		X		D
Clock Health test (#46) (b)	X	X		ND
Control Channel Loop-around test (#52) (a)	X	X		ND
Tone Generator Crosstalk test (#90)		X		ND
Tone Generator Transmission test (#40)	X	X		ND
Tone Generator Audit/Update test (#41)	X	X		ND
TDM bus Clock Circuit Status Inquiry test (#148) (c)	X	X		ND
TDM Bus Clock Slip Inquiry test (#149) (c)(e)	X	X		ND
TDM bus Clock PPM Inquiry test (#150) (c)	X	X		ND
TDM bus Clock Parameter Update test (#151) (c)	X	X		ND
Board Type Check test (#574) (c)	X	X		ND
Standby Reference Health Check test (#651) (c, d)		X		ND

1 D = Destructive; ND = Nondestructive

Notes:

a See "XXX-BD (Common Port Circuit Pack/Media Module)" for descriptions of these tests.

b See "TONE-BD (Tone-Clock Circuit)" for descriptions of these tests.

c See "TDM-CLK (TDM Bus Clock)" for descriptions of these tests.

d This test only runs on the standby IPSI or Tone-Clock circuit in a PN with more than one IPSI or Tone-Clock circuit pack (high- or critical-reliability system). The circuit pack must be a TN780 code with firmware revision 2 or above.

e Test #149 does not run on the TN2182 or TN2312.

Tone Generator Transmission Test (#40)

The purpose of this test is to verify that the tone generation hardware on the IPSI or Tone-Clock circuit pack is capable of generating a subset of system tones and a set of test tones. This test does not verify all system tones the tone generator produces during normal system operation.

The test is performed in two parts. For the first part, the Tone Generator is told to generate the touch-tone digits. The digits are received and checked by a Tone Detector's touch-tone detector. If any of the digits fail, the test is repeated using a touch-tone detector in another Tone Detector circuit pack.

For the second part, the Tone Generator is told to generate call-progress tones that are detected and identified by a tone detector. These tones are:

- 440 Hz
- 2225 Hz
- Digital Count

The tone generator is then told to generate a sequence of test tones whose output levels are measured by a tone detector. These tones are:

- 404 Hz at 0 dB
- 1004 Hz at -16 dB
- 1004 Hz at 0 dB
- 2804 Hz at 0 dB

A Tone Detector's general-purpose tone detector listens for tones and measures their quality. If any of the measured values are not within limits, the test is repeated using a general-purpose tone detector in a different Tone Detector circuit pack. If the values are still out of the limits, the test will fail.

For every failure case of Test #40, do the following:

1. Check that all Tone Detector circuit packs have the same companding mode as that administered for the system. Correct the situation if there is a mismatch.
2. Run the long test sequence: **test tone-clock *PC* long repeat 1**.
3. If the problem persists, replace the IPSI or Tone-Clock circuit pack (**S8100**: TN2314 Processor/Tone-Clock circuit pack) by following the steps outlined in Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

WARNING:

S8100: When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to "Obtaining a License File" in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.

Table 831: Test #40 Tone Generator Transmission Test

Error Code	Test Result	Description / Recommendation
None	ABORT	The system was not able to allocate all the resources needed for this test or there was an Internal system error.
1	ABORT	The system could not allocate all the resources needed to test the DTMF tones.
1001	ABORT	The system was not able to put the tone generation facility in the appropriate mode to test it.

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Table 831: Test #40 Tone Generator Transmission Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. If the system is not heavily loaded, use **test tdm port-network *PN#*** to test the TDM bus. **1** Retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test connection. This can happen when the system is heavily loaded or there is not an IPSI or Tone Detector circuit pack in the port network where this test is being executed. **1** Make sure there is an IPSI or Tone Detector circuit pack in the same port network. **2** If the circuit pack is missing, install one in the same port network. **3** Allow approximately 1-minute for Tone Detector maintenance to run on the newly inserted IPSI or Tone Detector circuit pack. **4** Retry the command at 1-minute intervals up to 5 times.
1022	ABORT	Tone detection for the system is administered as wide broadband (tone detection mode 5), and the Tone Detector used for this test was not a TN420C (the only circuit pack with this capability) (**S8100**: TN744). GPTD ports on other types of Tone Detector circuit packs are taken out of service since they cannot provide the administered function. Either: • Change the tone-detection mode administered on the system-parameters country-options screen. (Refer to *Administrator's Guide for Avaya™ Communication Manager, 555-233-506*.) • Remove all non-TN420C (**S8100**: non-TN744) circuit packs from the system.
2000	ABORT	Response to the test request was not received within the allowable time period. System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1 (a)	FAIL	DTMF generation failed for the active tone generator.
105 (a)	FAIL	Generation of 440-Hz failed.
109 (a)	FAIL	Generation of 2225-Hz failed.
110 (b)	FAIL	Generation of 404-Hz level invalid.
111 (b)	FAIL	Generation of 1004-Hz low level invalid.
112 (b)	FAIL	Generation of 1004-Hz high level invalid.
113 (b)	FAIL	Generation of 2804-Hz level invalid.
115 (b, c)	FAIL	Generation of digital count sequence invalid.
120 (a)	FAIL	Generation of quiet tone failed.
1044 (a)	FAIL	DTMF generation failed to generate Digit 1 for the standby tone generator.
1045 (a)	FAIL	DTMF generation failed to generate Digit 5 for the standby tone generator.

Table 831: Test #40 Tone Generator Transmission Test

Error Code	Test Result	Description / Recommendation
1046 (a)	FAIL	DTMF generation failed to generate Digit 9 for the standby tone generator.
1047 (a)	FAIL	DTMF generation failed to generate Digit D for the standby tone generator.
	PASS	The tone generation facility is able to generate and transmit all the tones.

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Notes:

Except in EPNs containing more than one IPSI or Tone-Clock circuit pack, replacing an IPSI or Tone-Clock circuit pack is a service disrupting procedure. The test should be run several times with more than one failure before the replacement policy specified in the following notes is executed. Use the procedure described in Replacing the IPSI or Tone-Clock Circuit Pack on page 1911.

a All the failure error codes marked with (a) may affect users if the failure is on the active tone generator. When this type failure is detected, the system will attempt to move the tone generation function to the alternate IPSI or Tone-Clock circuit pack, if one is present in the affected port network. When the tone generation facility fails in this way, especially in a port network without duplicated IPSI or Tone-Clock circuit packs, the faulty IPSI or Tone-Clock circuit pack should be replaced promptly. See warning below.

b All the failure error codes marked with (b) are almost transparent to the user. Again, when this type failure is detected, the system will attempt to move the tone generation function to the alternate IPSI or Tone-Clock circuit pack, if one is present in the affected port network. Users may or may not hear any noisy tones. This type of failure affects maintenance on other objects. Maintenance may not be able to run on other objects which use the tone generation facility (that is, Tone Detector circuit maintenance). In this case, the IPSI or Tone-Clock circuit pack can be replaced as suitable to the customer.

c Error code 115 may also be caused by TDM bus corruption. This normally means a physical problem with bent backplane pins, TDM/LAN bus cabling, or TDM/LAN bus terminators. Such physical problems should especially be suspected if board replacement or other physical activity has occurred just before this error is observed.

Use **display errors** to look for errors on other circuit packs in the carriers of the same port network as the indicated Tone-Clock circuit. If any are found, they should be resolved if possible, and the IPSI or Tone-Clock circuit pack retested. If this does not clear the problem, the IPSI or Tone-Clock circuit pack should be replaced and the new one tested. If the problem persists, follow instructions for TDM bus maintenance in this manual.

WARNING:

S8100: When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.

Tone Generator Update/Audit Test (#41)

The active tone generation facility is refreshed with all the time slot tone information. This test also triggers in-line error messages the IPSI or Tone-Clock circuit pack (**S8100**: TN2314 Processor/Tone-Clock circuit pack) generates when it detects problems by itself.

A check is also made between the type of Tone-Clock being tested and the type of Tone-Clock needed based on system administration. The administration on the system-parameters country-options screen may imply that a TN780 (**S8100**: TN2314) is required.

Table 832: Test #41 Tone Generator Update/Audit Test

Error Code	Test Result	Description / Recommendation
none	ABORT	The system was not able to allocate all the resources needed for this test.
2100	ABORT	System resources required for this test are not available.
1	FAIL	The system requires a TN780, TN2182, or TN2312 Tone-Clock circuit to support the administered country-options tone-generation parameters. **1** Check the administration on the system-parameters country-option screen. Specifically, the Base Tone Generation Set on page 1 and any custom tone administration beginning on page 2. **2** Replace any existing IPSI with a TN2312., or an existing Tone-Clock circuits packs with a TN780 or TN2182. **3** **S8100**: Replace existing tone-clock circuit packs with a TN2314 Processor/Tone-Clock. **WARNING:** **S8100**: When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server, 555-234-100*. Retry the command and if the test fails, replace the circuit pack.
	PASS	The tone generation facility has been successfully refreshed with its time-slot translation and system administration is consistent with this type of Tone-Clock. **1** Display the Hardware Error Log using **display errors** to make sure this circuit pack did not generate new errors.

Tone Generator Crosstalk Test (#90)

This test checks the ability of the Tone Generator to talk on a specific time slot. The tone generator is told to talk on a specific time slot. The other idle time slots are checked to make sure the Tone Generator put the tone on only the specified time slot.

Table 833: Test #90 Tone Generator Crosstalk Test

Error Code	Test Result	Description / Recommendation
None	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1001	ABORT	The system was not able to put the tone generation facility in the appropriate mode to test it.
1002	ABORT	The system could not allocate time slots for the test connection. This can happen when the system is heavily loaded. If the system is not heavily loaded, then test the TDM-BUS via **test tdm port-network *PN#***.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 833: Test #90 Tone Generator Crosstalk Test

Error Code	Test Result	Description / Recommendation
	FAIL	The Tone Generator could be defective. In a port network with more than one IPSI or Tone-Clock circuit pack, the system will attempt to move the tone generation function to the alternate one. **1** Test the IPSI or Tone-Clock circuit pack again via **test tone-clock *UUC***. **2** If the test fails again, look at the Hardware Error Log for Tone Detector circuit pack errors. **3** If there are Tone Detector circuit pack errors, see Tone Detector maintenance documentation (DTMR-PT (Dual-Tone Multifrequency Receiver Port) on page 870, GPTD-PT (General-Purpose Tone Detector Port) on page 1046, CLSFY-PT (Call Classifier Port) on page 617, ETR-PT (Enhanced Tone Receiver Port) on page 904 to resolve these errors first. **4** If there are no Tone Detector circuit pack errors, then the IPSI or Tone-Clock circuit pack (**S8100**: TN2314 Processor/Tone-Clock) should be replaced. See *Replacing the IPSI or Tone-Clock Circuit Pack* on page 1911. **WARNING:** **S8100**: When the disk is replaced on the TN2314, a new license file must be downloaded to the system before the system will become operational. Refer to “Obtaining a License File” in Chapter 3 of *Installation and Upgrades for the Avaya™ G700 Media Gateway Controlled by an Avaya™ S8300 Media Server or an Avaya™ S8700 Media Server*, *555-234-100*. Retry the command and if the test fails, replace the circuit pack.
	PASS	The tone generation facility is able to put tones out.

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TRANS-STO (Translation Storage)

S8100 only

MO Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
TRAN-STO	MAJOR[1]	**test translation-store**	Translation Store
TRAN-STO	MINOR	**test translation-store long**	Translation Store
TRAN-STO	WARNING	**test translation-store short**	Translation Store

1 The "MAJOR" alarm occurs only at power-up time or on a Reset System 3 or 5 when the switch cannot load any translations.

This maintenance object, Translation-Store (TRANS-STO) supports maintenance testing of translation files stored on the hard disk. Maintenance actions concerning (TRANS-STO) are associated with maintaining translation file integrity and checking for translation read and write (save) errors.

Error Log Entries and Test to Clear Values

Table 834: TRAN-STO Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test translation-store
1281(a)	Any	Translation File Data Integrity Test (#694)	MINOR	OFF	test translation-store long
3329(b)	any	None	MINOR/ MAJOR (SUPER)	OFF	
3841(c)	Any	Save Translation	MINOR	OFF	save translation
3842(d)	Any	Save Translation	MINOR	OFF	save translation

1 Indicates that an alarm was raised but that the associated error could not be entered into the hardware error log due to a momentary overload condition. Run the short test and refer to the appropriate test description for tests that fail.

Notes:

a Error-Type:1281. Translation file data integrity test. The translations file test detected a checksum error on the translation file during the read operation. The hard drive can no longer hold the written data. Enter the save translation command to restore the translations. Then, run the test translation-store long command to clear the alarm. If the error occurs repeatedly, restore the translation file and then do a warm reset on the system.

b Error-Type 3329. There was an error while translations were being loaded. The relevant alarm occurs at power-up or on a Reset System 3 or 5 if the switch cannot load translations.

In a standard system, the alarm invokes Emergency Transfer.

c Error-Type 3841. Save Translation. The error indicates that the translation file cannot be saved to the hard disk. This indicates that the file is possibly being accessed by another application. Allow between 30 seconds to a minute before attempting to save translation again. If the error continues, perform a warm restart on the system.

d Error-Type 3842. Save Translation error. This error indicates a system error when saving translation. Attempt to save translation again after a 30 second to 1 minute interval. Enter **test trans store clear** to clear the alarm. If error continues, perform a warm restart.

System Technician-Demanded Tests: Descriptions and Error Codes

Always investigate tests in the order presented in the table below. By clearing error codes associated with the *Translation File Data Integrity Test* for example, you may also clear errors generated from other tests in the testing sequence.

Table 835: System Technician-Demanded Tests: TRANS-STO

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
Translation File Data Integrity Test (#694)	X	X		ND

1 D = Destructive; ND = Nondestructive

Translation File Data Integrity Test (#694)

This test is nondestructive.

This test, verifies the integrity of the translation file stored on the hard drive by reading the translation file stored on disk and then performing checksum error checking. The calculated checksum value is compared with the recorded checksum value in the translation file. If these two values are different, this indicates that the translation file is corrupted.

Note: This file data integrity test consists of two copies of the translation file. It performs a checksum on each copy of the translation file and returns the good copy of the file to be accessed. If and only if both copies of translation files have detected an error during the translation test will it generate an alarm and error.

When restoring or backing up translation files, both copies of the translation must be backed up.

Table 836: TEST #694 Translation File Data Integrity Test

Error Code	Test Result	Description/ Recommendation
2012 2106 2114	ABORT	Internal system error **1** Retry the command at 1-minute intervals a maximum of 5 times.
2013 2100 none	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals a maximum of 5 times.
Any	FAIL	A checksum error is detected in the translation file. **1** Enter the **save translation** command, and verify that translations can be successfully saved onto the hard disk. **2** Rerun the test. **3** If the test fails again, restore the translation file, and repeat Steps 1 and 2. [See Installation Manual, Chapter 3, “Backup and Restore”.
	PASS	No checksum error is found in the translation file.

TR-LN-BD (Trunk Line Board)

S8700 / S8500 / G700

The TN797 Analog Trunk and Line circuit pack provides 8 ports, any of which may be administered as one of the following:

Table 837: TN797 Analog Trunk and Line circuit pack – port administration

Function	Group Type	Trunk Type	LED MWI
Central Office trunk (CO)	co fx wats	loop start ground start	
CAMA/E911 trunk	cama		
Direct Inward Dialing (DID) trunk	did	wink start immed start	
Analog Line on-or-off premises	n/a	n/a	with/ without MWI

NOTE:
G700: The separate, but equivalent, MG-ANA MO can reside in slots 1–4 of a G700 media gateway. Refer to MG-ANA (ANALOG MM711) on page 1246 for information about this MO.

In the U.S., Canada, and like countries, every CO trunk port of TN797 Analog Trunk and Line circuit packs should be administered as GS (ground-start) trunks rather than as loop-start trunks, because GS signaling provides disconnect supervision, and loop start does not. If for some reason, a port on the TN797 must be administered as loop start, it must be administered as 1-way only – either incoming or outgoing – not only at the switch, but also at the CO switch. This is necessary to avoid collisions (i.e., “glare”) and other highly undesirable conditions.

The TN797 Analog Trunk and Line circuit pack does not support Neon Lamp MWI (Message Waiting Indication). No maintenance of the terminal connected to the Neon Analog Line circuit pack is performed.

For circuit pack problems, see XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

TSC-ADM (Administered Temporary Signaling Connections)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
TSC-ADM	none	none	Administered Temporary Signaling Connections

No alarms are generated for Administered Temporary Signaling Connections (TSC-ADM, also called ADM TSCs).

Administered temporary signaling connections (TSC) provide a path through ISDN-PRI networks for supplementary D-channel messages. ISDN-PRI applications such as the Distributed Communications System (DCS) use temporary signaling connections to exchange user information across an ISDN-PRI network. What makes Administered TSCs unique is that these particular TSCs stay active for an extended period of time, similar to a permanent data connection. These ADM TSCs are used for DCS features that require Non-Call Associated (NCA) TSCs, and the ADM TSC provides the logical channel function in a DCS network.

An NCA TSC is a virtual connection established within a D channel without associating any B-channel connections. The connection provides user-to-user service by exchanging USER INFORMATION messages without associated B-channel connections.

An Administered TSC is a special NCA TSC defined for the DCS over the ISDN-PRI D channel. The ADM TSC has an administratively defined endpoint and is established for an extended period of time.

There are two types of ADM TSCs:

- Permanent

  These are established by the originating PBX (near-end ADM TSC) or by the terminating PBX (far-end ADM TSC). Once these ADM TSCs are established, they remain active.

- As-Needed

  These are established only when needed.

ADM TSC maintenance provides a strategy to verify that a far end can respond to an ISDN-PRI USER INFORMATION TSC heartbeat message, thereby indicating that user-user signaling is functioning. In addition, maintenance can retrieve the status of the ADM TSC's connection state.

Since ADM TSCs are administered on a per signaling-group basis, the health of an ADM TSC also depends on the state of the D channel or D-channel pair administered per signaling group. See ISDN-SGR (ISDN-PRI Signaling Group) on page 1127 documentation for details on ISDN-PRI NFAS and D-channel backup maintenance.

The two administration commands for ADM TSCs are as follows:

- **add signaling-group *number***
- **change signaling-group *number***

The two maintenance commands for ADM TSCs are as follows:

- **test tsc-administered *signaling-group-number*** [***/tsc-index***]
- **status tsc-administered *signaling-group-number*** [***/tsc-index***]

Error Log Entries and Test to Clear Values

Table 838: ADM TSC Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3840-3967 (a)	tsc index #	**test tsc-administered**			

Error Note:

a There is no Test to Clear Value for error types 3840–3967. These error types provide the following additional data that may prove useful when tracking down problems.

Any of these errors indicates that a TSC Heartbeat Inquiry test was run on an active far-end Administered TSC from the switch. Upon receiving the heartbeat message, the network communicated that the call was unable to complete. As a result, the error was logged. Check the signaling group status of the D channel or D-channel pair via **status signaling-group *group*** for the Administered TSC. Check the status of the Administered TSC via **status tsc-administered**. Also check the administration of the Administered TSC on the switch.

This error may only be affecting service for some DCS customers. Upon receipt of this error condition, the switch will tear down and re-establish the ADM TSC within 20 minutes.

The port field in the error log contains the signaling group number for TSC-ADM errors.

System Technician-Demanded Tests: Descriptions and Error Codes

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TSC Heartbeat Inquiry test (#604)			ND

1 D = Destructive; ND = Nondestructive

TSC Heartbeat Inquiry Test (#604)

This test can be invoked by system technician personnel for any ADM TSC administered in the switch. Most of the error conditions on the following table will not log an error, but switched services may take some type of recovery action in certain instances.

This test sends a USER INFORMATION TSC heartbeat message inquiry across an ADM TSC to determine whether the far end can respond to a USER INFORMATION TSC heartbeat message.

Table 839: Test #604 TSC Heartbeat Inquiry Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Reissue the **test tsc-administered** command at 1-minute intervals up to 5 times.
1005	ABORT	The Administered TSC does not exist. **1** Display the administration for the Administered TSC. **2** If an Administered TSC exists, reissue **test tsc-administered**.
1113	ABORT	The D channel is out-of-service. **1** See ISDN-PLK (ISDN-PRI Signaling Link Port) on page 1121.
1145	ABORT	There is congestion in the network. **1** Issue the **status tsc-administered** command at 1-minute intervals up to 5 times. **2** If the congestion does not clear, disable and enable the Administered TSC via **change signaling-group *group***. **NOTE:** To disable the Administered TSC, display the (administration) Signaling Group screen using **change signaling-group *group*** where ***group*** is the number of the signaling group under which the suspect TSC is administered. Set the `Enable` field to **n**. To enable the ADM TSC, set the `Enable` field to **y**. **3** If the congestion still does not clear, check other nodes in the network.
1146	ABORT	The congestion just occurred in the network. **1** Issue **status tsc-administered** at 1-minute intervals up to 3 times. **2** If congestion does not clear, disable and enable the Administered TSC via **change signaling-group *group***. **NOTE:** To disable the Administered TSC, display the (administration) Signaling Group screen using **change signaling-group *group*** where ***group*** is the number of the signaling group under which the suspect TSC is administered. Set the `Enable` field to **n**. To enable the ADM TSC, set the `Enable` field to **y**. **3** If congestion still does not clear, check the other nodes in the network.
1147	ABORT	The ADM TSC is being torn down. **1** Issue **status tsc-administered** at 1-minute intervals up to 3 times. **2** If ADM TSC is still down, disable and enable the ADM TSC via **change signaling-group *group***. **NOTE**: To disable the ADM TSC, display the (administration) Signaling Group screen via **change signaling-group *group*** where ***group*** refers to the number of the signaling group under which the suspect TSC is administered. Set the `Enable` field to **n**. To enable the ADM TSC, set the `Enable` field to **y**. **3** If the ADM TSC is still down, check the other nodes in the network.

Table 839: Test #604 TSC Heartbeat Inquiry Test

Error Code	Test Result	Description / Recommendation
1148	ABORT	The ADM TSC is enabled, but inactive (near end). **1** Disable and enable the ADM TSC. **2** Reissue **test tsc-administered**. **3** If the ADM TSC is still inactive, check the other nodes in the network.
1149	ABORT	The ADM TSC is disabled. **1** Enable the TSC, and see if the status indicates `active`. **2** Reissue **test tsc-administered**. **3** If the TSC still disabled, remove the ADM TSC from the system.
1181	ABORT	Ran out of ADM TSC resources. **1** Reissue **test tsc-administered** at 1-minute intervals up to 3 times.
1182	ABORT	The BX.25 link is down at the gateway. **1** Disable the ADM TSC. **2** Check the status of the gateway link via **status link *link-num***. **3** Once the gateway link indicates an `in-service` state, enable the Administered TSC. **4** Reissue **test tsc-administered**.
2000	ABORT	The Administered TSC is not responding to a TSC heartbeat inquiry. **1** Retry **test tsc-administered** at 1-minute intervals up to 3 times. **2** If the problem continues to fail, obtain the status of the D channel or D-channel pair associated with the ADM TSC via **status signaling-group *group***. If the D channel is INS (i.e., in-service) and the status of the ADM TSC appears to be active, then disable and enable the ADM TSC through administration. **NOTE**: To disable the ADM TSC, display the (administration) Signaling Group screen via **change signaling-group *group*** where ***group*** refers to the number of the signaling group under which the suspect TSC is administered. Set the `Enable` field to **n**. To enable the ADM TSC, set the `Enable` field to **y**. **3** Reissue **test tsc-administered**. **4** If the test fails, check the ADM TSC node on the other side of the network to verify that the ADM TSC is indeed active.
2012	ABORT	Internal system error. **1** Reissue **test tsc-administered** at 1-minute intervals up to 5 times.

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Table 839: Test #604 TSC Heartbeat Inquiry Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The Administered TSC is not active (far end). **1** Reissue **test tsc-administered**. **2** Verify that the Administered TSC node on the other side of the network is active. **3** Disable and enable the Administered TSC. **4** Retry **test tsc-administered**.
2	FAIL	Facility IE (Information Element) reject. **1** Check every other node in the network, and make sure Administered TSC is active.
	PASS	The Administered TSC responded to a heartbeat.

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TTR-LEV (TTR Level)

S8700 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
TTR-LEV	WARNING	1	TTR Level
TTR-LEV	MINOR	1	TTR Level
TTR-LEV	MAJOR	1	TTR Level

1 See the Repair Procedure for TTR-LEV on page 1947.

TN748 and TN420 Tone Detector circuit packs and TN744 Call Classifier circuit packs provide tone receivers for detecting various types of signaling tones. These circuit packs are shared resources that serve every user of the PBX. This discussion uses the following terms and abbreviations (note that the maintenance-related system parameters screen uses different names than the alarm and error logs):

Type of Tone Receiver	MO	Also Known As	Location
Dual-Tone Multifrequency Tone Receiver	DTMR-PT	Touch-Tone Receiver (TTR)	4 per TN420/TN748
General-Purpose Tone Detector	GPTD-PT	Call-Progress Tone Receiver (CPTR)	2 per TN420/TN748
Call Classifier	CLSFY-PT	Call-Classification Tone Receiver (CCTR)	8 per TN744

TN748s and TN420s each have 4 DTMR-PTs and 2 GPTD-PTs. DTMR-PTs interpret dual-tone multifrequency (DTMF) calling signals and translate them into logical digits 0 through 9, *, and #. GPTD-PTs detect call-progress tones, modem answer tones, and transmission test tones.

TN744 Call Classifier circuit packs have 8 CLSFY-PTs. These ports detect DTMF tones and classify network and MFC (multifrequency compelled) signaling tones. (That is, CLSFY-PTs can function as DTMR-PTs or GPTD-PTs, and have other additional capacities).

S8100

A TN2314 Tone-Clock/Detector/Call Classifier and the TN744D Call Classifier circuit packs provide touch tone receivers (TTRs or DTMR-PTs) that are devices used to interpret touch tone calling signals and to translate the dual tones into the following valid digits: 0 through 9, *, and #. A Tone Detector circuit pack is a resource shared by all PBX users and also has general purpose tone detector ports (GPTD-PTs) to detect call progress tones, modem answer tones, and transmission test tones. Call Classifier Ports (CLSFY-PTs) have also been added to detect voice or network intercept tones. A Call Classifier Port (CLSFY-PT) can function as either a DTMR-PT or as a GPTD-PT.

When a user goes off-hook to place a call, dial tone is returned to the user, indicating that a tone detector is connected and ready to receive and interpret tones. The tone detector is in use until the total number of digits needed is collected or until a time-out occurs. If every tone detector in the system is being used simultaneously, the next user to go off-hook will not receive dial tone until a tone detector becomes available. It is therefore necessary to have a sufficient number of tone detectors in the system to prevent delays in receiving dial tone. The **list measurements tone-receiver** command shows the level of tone detector usage.

In order to prevent dial-tone delays and other shortcomings in system performance, threshold levels for the 3 types of tone receivers are administered on the **change system-parameters maintenance** screen. Whenever the number of tone receivers in service falls below the administered threshold for that type of tone receiver, an alarm is logged against the TTR Level MO. At this point, the system is operating properly, but call processing capacity is reduced. Another alarm is logged if the number falls to zero. At this point, system operation is severely compromised.

Typical causes of these events are:

1. The threshold for GPTD-PTs or DTMR-PTs is administered incorrectly on the ***maintenance-related system-parameters*** screen.
2. Too many GPTD-PTs, DTMR-PTs, or CLSFY-PTs have been taken out of service, possibly by maintenance software or a demand busyout.
3. A tone detector circuit pack has been removed or suffered a fatal failure, resulting in the loss of all its ports.
4. The system has an insufficient number of TN748/TN744/TN420 circuit packs.

Repair Procedure for TTR-LEV

To resolve a TTR-LEV alarm:

1. **Display errors** and use the TTR-LEV Error Log Table to determine which type of tone receiver has fallen below its threshold. **S8100**: In the Hardware Error Log Table, the error type field of the TTR-LEV MO has a value of 2 for DTMR-PT level, a value of 4 for GPTD-PT level, or a value of 6 for CLSFY-PT level.
2. Enter **change system-parameters maintenance**, and check the administered value. On the screen, TTR represents DTMR-PTs, CPTR represents GPTD-PTs, and Call Classifier represents CLSFY-PTs. If the threshold value is set too high, change it to a lower value and wait a minute for the alarm to clear.

   To determine the correct thresholds, first find the total number of TN478/TN420 Tone Detector and TN744 Call Classifier circuit packs in the system using **list configuration**. Then calculate the total number of tone receiver ports of each type. Each Tone Detector circuit pack has 4 TTR (DTMR) ports and 2 CPTR (GPTD) ports. Each TN744 Call Classifier circuit pack has 8 Call Classifier (CLSFY-PT) ports.

   For each type of tone receiver, if the total number of ports installed in the system is less than the administered threshold, either add more circuit packs to the system or reduce the threshold to match the number already in the system. If the TTR Level alarm is still present, proceed to Step 3.
3. **Display errors** for error type 18 and look for GPTD-PTs, DTMR-PTs, or CLSFY-PTs that have been busied out. **S8100**: A port that has been busied out has a value of 18 in the error type field of the Hardware Error Log.

For each of the busied-out ports:

a Determine why the port was busied out.

b If the port can be placed back into service, test the port via **test port *UUCSSpp***.

c If every test passes, **release port** and wait 1 minute for the TTR Level alarm to clear.

If this does not clear the TTR Level alarm, proceed to Step 4.

4 **Display alarms** and determine the location of the circuit pack with the alarmed GPTD-PT, DTMR-PT, or GPTD-PT.

Test board *UUCSS* long rep 3 for that circuit pack.

If this does not clear the TTR Level alarm, replace the Tone Detector or Call Classifier circuit pack with the alarmed GPTD-PT, DTMR-PT, or CLSFY-PT.

Error Log Entries and Test to Clear Values

Table 840: TTR Level Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	1	None			
2 (b)	2		WARNING (See WARNING message below)	OFF	
3 (c)	3	None			
4 (d)	4		WARNING	OFF	
5 (e)	5	None			
6 (f)	6		WARNING	OFF	
7 (g)	7		MAJOR	OFF	
8 (h)	8		MINOR	OFF	
9 (i)	9		MINOR	OFF	

WARNING:

The Alarm is upgraded to MAJOR if the Base Tone Generator is set to 12 (France).

Notes:

a Error code 1 does not indicate a current error condition. It indicates that the number of DTMR ports in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

b The total number of DTMR ports currently in service is below the administered threshold. To clear the alarm, see Repair Procedure for TTR-LEV on page 1947.

c Error code 3 does not indicate a current error condition. It indicates that the number of GPTD ports in service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

d The total number of GPTD ports currently in service is below the administered threshold. To clear the alarm, see Repair Procedure for TTR-LEV on page 1947.

e Error code 5 does not indicate a current error condition. It indicates that the number of Call Classifier ports (CLSFY-PT) service was below the administered threshold, but is now equal to or greater than the threshold. These errors are typically generated during boot time or other transitional states when the ports are being brought into service.

f The total number of Call Classifier ports (CLSFY-PT) currently in service is below the administered threshold. To clear the alarm, see Repair Procedure for TTR-LEV on page 1947.

g There are currently no DTMR ports in service. To clear the alarm, see Repair Procedure for TTR-LEV on page 1947.

h There are currently no GPTD ports in service. To clear the alarm, see Repair Procedure for TTR-LEV on page 1947.

i There are currently no Call Classifier ports (CLSFY-PT) in service. To clear the alarm, see Repair Procedure for TTR-LEV on page 1947.

UDS1-BD (UDS1 Interface Circuit Pack)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
UDS1-BD	MAJOR	**test board *location* sh**	UDS1 Interface Circuit Pack
UDS1-BD	MINOR	**test board *location* l**	UDS1 Interface Circuit Pack
UDS1-BD	WARNING	**test board *location* sh**	UDS1 Interface Circuit Pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
G700: The separate, but equivalent, MG-DS1 MO can reside in slots 1–4 of a G700 Media Gateway.

The UDS1 Interface circuit pack provides an interface to the DS1 facility.

The maintenance strategy for the TN464 UDS1 Interface circuit pack (UDS1-BD) is very similar to the maintenance strategy for the TN767 DS1 Interface circuit pack (DS1-BD). The same commands are used for administering and testing the boards. The differences in maintenance strategy between the boards are due to the UDS1 circuit pack's direct interface to the Packet bus which is used for ISDN-PRI signaling (ISDN-LNK). While both the TN464 and TN767 can support ISDN-PRI B channels, ISDN-PRI D-channel signaling applications require a TN464 UDS1 circuit pack. See the following table for a list of USD1 Interface circuit packs:

Circuit Pack Code	24 Channel	32 Channel	Tie Trunk Signaling	CO Trunk Signaling	DID Trunk Signaling	OPS Line Signaling
TN2242	X	X	X			
TN464C/D/E/F **S8100**: TN464GP	X	X	X	X	X	X (24-chl only)
TN2464	X	X	X	X	X	X

UDS1 Interface circuit pack Maintenance documentation provides a strategy for maintaining the UDS1 Interface circuit pack. The maintenance strategy deals with logging the in-line errors reported by the UDS1 Interface circuit pack, running tests for error diagnosis and recovery, and raising or clearing maintenance alarms.

The TN464F or later circuit pack combined with an 120A1 CSU module forms an Enhanced Integrated CSU. The 120A1 CSU module, when combined with the functionality provided by the TN464F hardware and firmware, and switch software, provides functionality equivalent to an external stand-alone ESF T1 CSU. The 120A1 CSU module connects to the TN464F circuit pack on the I/O connector panel behind

the port carrier. The CSU module, thus becomes an integrated part of the system. Throughout the document, the term 120A1 will mean a 120A1 or later suffix CSU module.

The Enhanced Integrated CSU is for use in the United States of America with 1.544-Mbps DS1 service. For further details on the 120A1 CSU module refer to *DEFINITY® Communications System Generic 1, Generic 2 and Generic 3 V1 and 2 – Integrated Channel Service Unit (CSU) Module Installation and Operation, 555-230-193*.

2Mbit Japan Trunk (TN2242)

The TN2242 2-Mbit, 30-port trunk circuit pack supports Japanese TTC private networking environments. This circuit pack interfaces only with network equipment or other circuit packs of the same model and is incompatible with every other digital trunk circuit pack.

The maintenance strategy for the TN2242 is similar to that of the TN464F or later suffix DS1 interface circuit pack. The TN2242 circuit pack is functionally the same as the TN464F (without ICSU) with the following exceptions:

- The Blue Alarm Inquiry test (#139) always passes for the TN2242.
- The **test ds1-loop** command is not executed for the TN2242.
- When **reset board** is run on a TN2242, a different initialization message is sent for the local loop-around test (Test #135) is executed.
- Since an ICSU (Integrated Channel Service Unit) is not supported on this circuit pack, tests associated with an ICSU are not executed.
- Tests associated with new functionality available with the video-enabled TN464F are not executed for the TN2242.
- CRC (cyclical redundancy check) is not defined for this circuit pack.
- The D channel can be user-assigned to any port 1 – 30, when the signaling mode is ISDN PRI.
- Wideband is not supported.
- OPSs (off-premises stations) are not supported.

The TN2242 circuit pack also supports specialized versions of CAS (channel- associated signaling) and ISDN-PRI signaling that pertain to the TTC private networking environment in Japan.

Upgrading to TN2242

Figure 148 shows the hardware connections for public network access in Japan. The upgrade procedure requires removing the JRC (Japan Radio Corporation) external converter.

Figure 148: Japanese TTC public network connections

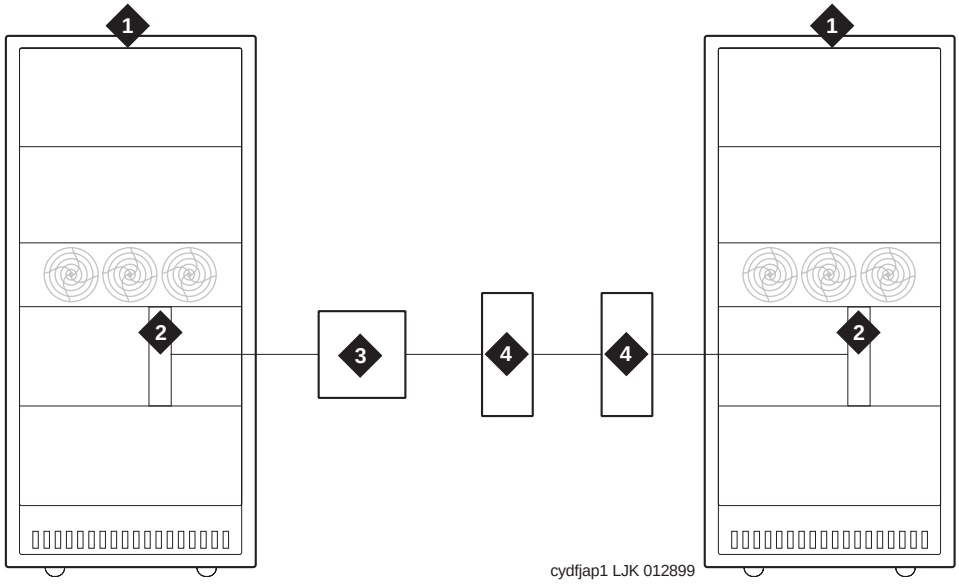


Figure Notes:

1 Communications System

2 UDS1-BD DS1-CONV circuit pack
(24-trunk digital tie trunk)

3 JRC (Japan Radio Corporation) external converter

4 TDM facilities

Figure 149, TN2242 Japan trunk TTC private network connections, on page 1953 shows the hardware connections for private network access using the TN2242 circuit pack.

Figure 149: TN2242 Japan trunk TTC private network connections

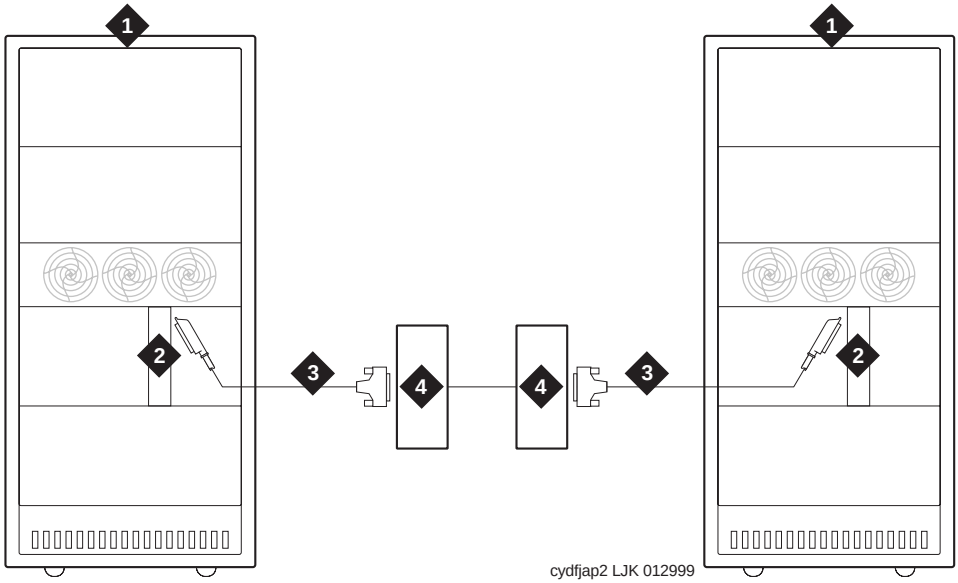


Figure Notes:

1 Communications System

2 TN2242 2-Mbit Japan trunk circuit pack

3 H600-513 cable assembly cable. (See ‘‘H600-513 Cable Pinout’’).

4 TDM facilities

To upgrade a system to the TN2242 circuit pack:

1. Busyout the UDS1-BD DS1-CONV circuit pack (**busyout board *UUCSS***).
2. Remove the TN464 administration (**change circuit pack, change ds1**, and **change trunk group *n***).
3. Remove the UDS1-BD circuit packs.
4. Remove the JRC (Japan Radio Corporation) external converter and cable.
5. Insert the TN2242 circuit packs.
6. Connect the TN2242 to the TDM with the H600-513 cable assembly.
7. Administer the TN2242 circuit pack (see ‘‘Administration’’).

H600-513 Cable Pinout

Table 841 shows the pinout for the H600-513 cable assembly:

Table 841: H600-513 cable assembly pinout

TN2242			TDM	
50-pin connection pin number	**Color**	**Lead Designation**	**Color**	**15-pin connection pin number**
22	W-BL	Line in +	W-BL	4
23	W-O	Line out -	W-O	9
47	Bl-W	Line in -	Bl-W	11
48	O-W	Line out +	O-W	2

Administration

The TN2242 circuit pack requires board-level translation data. Before administering any ports on the circuit pack, administer the following forms:

- Circuit pack (**change circuit-pack**)
- DS1 (**add ds1**)
- Trunk group (**add trunk-group *n***)

  Table 842 outlines the trunk group administration parameters that are required for this interface to operate successfully in Japan.

Table 842: TN2242 administration

Field	Value
Trunk Group screen, Page 1	
Trunk Type (in/out)	wink, delay, immed (every permutation)
Trunk Signaling Type	blank
Answer Supervision Timeout	0
Receive Answer Supervision	y
Disconnect Supervision - In?	y
Disconnect Supervision - Out?	y
Incoming Dial Type	tone, rotary, mf (to other Avaya systems only)
Wink Timer for wink type	300
Wink Timer for delay type	4500

1 of 2

Table 842: TN2242 administration

Field	Value
Trunk Group screen, Page 3 (Administrable Timers)	
Incoming Disconnect	100
Incoming Glare Guard	800ms or higher
Incoming Dial Guard	10
Incoming Incomplete Dial Alarm	25 or higher
Incoming Partial Dial	18
PPS	10 or 20
Make (for PPS 10)	35
Break (for PPS 10)	65
Make (for PPS 20)	15
Break (for PPS 20)	35
Outgoing Disconnect	100
Outgoing Glare Guard	800 or higher
Outgoing Rotary Dial Interdigit	800
Outgoing Seizure Response	5

2 of 2

LEDs

The LEDs on the faceplate of the TN2242 circuit pack indicate its status as described in Table 843.

Table 843: TN2242 LED interpretation

LED	Meaning
Red	• MAJOR alarm • MINOR alarm • Firmware initialization during circuit pack insertion
Amber	A port on the circuit pack is in use.
Green	Maintenance testing is in progress on the circuit pack or its ports.

Interactions with Other MOs

The TN2242 MO directly interacts with these MOs:

- "Synchronization"
- "TN2242 Trunk Ports"
- "Call Processing"

Synchronization

The DS1 facility plays a vital role in the synchronization subsystem. The IPSI or Tone-Clock circuit pack uses either the primary or secondary timing reference, whether internal (local – IPSI or Tone-Clock circuit pack) or external. TN2242 circuit packs can be administered as “primary” or “secondary” synchronization references.

The TN2242 circuit pack sends DS1 link status information to the synchronization reference switching algorithm. This algorithm determines whether timing references should be switched due to failure or restore conditions.

TN2242 Trunk Ports

The TN2242 circuit pack MO is responsible for monitoring the health of the DS1 facility. If a DS1 facility goes down, then that facility’s DS1 circuit pack instructs every MO associated with the DS1facility to place its trunks (or ISDN-PRI signaling link) in an out-of-service state.

Call Processing

The **busyout board** command tears down every call and signaling link associated with a TN2242 circuit pack.

TN2242 Serviceability

Hardware Connections

This circuit pack can be:

- Mated to another circuit pack of the same type when interconnecting two Communication Manager systems
- Directly connected to the TDM network device
- Directly connected to another vendor PBX using ISDN-PRI signaling

Loopbacks

There is no automatic process to signal the remote end to provide loopbacks for testing purposes. Every loop back to be tested with a single circuit pack must be a local loop back on the circuit pack.

Remote loopbacks may be possible with the TDM network equipment with appropriate coordination between BCS Services Technicians and the service technicians of the TDM equipment (considered a CPE device).

TN464GP/TN2464BP UDS1 Circuit Packs with Echo Cancellation

The TN464GP and TN2464BP UDS1 circuit packs feature an integrated echo canceller. Echo cancellation is a Software Right-To-Use feature that can be turned as needed. Echo cancellation supports channels carrying voice and is not intended for channels that support data. The TN464GP/TN2464BP have the capability to detect modem tone and turn off echo cancellation accordingly for the duration of a

data call. Echo cancellation on the TN464GP/TN2464BP is administrable per channel. The echo cancellation circuitry on a given TN464GP/TN2464BP is driven by administrable parameters.

The TN464GP/TN2464BP circuit packs are intended for use with ATM, IP, wideband, or other complex services which are likely to have problems with echo.

Echo cancellation on a TN464GP/TN2464BP is a right-to-use feature that is activated via license file. Echo cancellation is enabled on the System-Parameters Customer-Options screen. The `Maximum Number of DS1 Boards with Echo Cancellation` field on the System-Parameters Customer-Options screen indicates the number of DS1 boards on which echo cancellation is activated for a specific customer.

The DS1 CIRCUIT PACK screen for the TN464GP/TN2464BP circuit packs has fields to support echo cancellation: `Echo Cancellation, EC Direction`, and `EC Configuration`. The `Echo Cancellation` field appears when the Echo Cancellation feature is activated on the ***System-Parameters Customer Options*** screen. The `EC Direction` and `EC Configuration` fields appear when the `DS1 Echo Cancellation` field is enabled.

- `EC Direction` determines the direction from which echo will be eliminated, ether inward or outward.
- `EC Configuration` is the set of parameters used when cancelling echo. This information is stored in firmware on the UDS1 circuit pack.

Echo cancellation is turned on or off on a per trunk-group basis using **change trunk-group**. If the TRUNK GROUP field, `DS1 Echo Cancellation` is **y**, echo cancellation is applied to every TN464GP/TN2464BP trunk member in that trunk group. The echo cancellation parameters used for a given trunk member are determined by the Echo Cancellation Configuration Number administered on the ***DS1 Circuit Pack*** screen for that specific trunk's board.

NOTE:
It is not not necessary to busyout a port or trunk group to change the DS1 Echo Cancellation field on the Trunk Group screen. However, the modified setting does not take effect until one of the following occurs:

- Port is busiedout/released
- Trunk Group is busiedout/released
- Test runk group is executed
- Periodic maintenance runs

Echo cancellation on the TN464GP/TN2464BP is selectable per channel, even though it is administrable on a per trunk-group basis. For example, if all but two ports on a TN464GP/TN2464BP need to have echo cancellation applied, those two ports must be put in a trunk group where the `DS1 Echo Cancellation` field is **n**. The remaining ports are in a trunk group(s) where the `DS1 Echo Cancellation` field is **y**. A user can cancel echo coming from the network (far-end echo) or coming from the switch (near-end echo).

The TN464 UDS1 Circuit Pack

The TN464C, D, E, F, and GP Universal DS1 Interface circuit packs provide an interface to the DS1 facility, and are designed to support 24 DS0 channels on a 1.544-Mbps DS1 link, or 32 DS0 channels on a 2.048-Mbps link. (The 32-channel interface is not supported on G3r V1 systems.) The DS0 channels

can be administered as trunks to other switches, lines to off-premises stations, ports to line-side PRI terminating devices, or ports to other line-side non-PRI terminating devices. (DS0 channels on TN464/Bs can only be administered as trunks to other switches.) For more information about how TN464 ports can be used, see the MOs (MOs): ISDN-SGR (ISDN-PRI Signaling Group) on page 1127, ISDN-TRK (DS1 ISDN Trunk) on page 1141, ISDN-PLK (ISDN-PRI Signaling Link Port) on page 1121, PE-BCHL (PRI Endpoint Port) on page 1392, ''TIE-DS1 (DS1 Tie Trunk)'', CO-DS1 (DS1 CO Trunk) on page 623, DID-DS1 (Direct Inward Dial Trunk) on page 684, OPS-LINE (DS1 Off-Premises Station Line) on page 1361, and ''WAE-PORT (Wideband Access Endpoint Port)''.

NOTE:
For information about other DS1 circuit packs, see DS1-BD (DS1 Interface Circuit Pack) on page 760.

NOTE:
The TN464GP provides Echo Cancellation, and in addition, the TN464GP firmware may be updated using the firmware download feature.

Throughout this MO on the UDS1-BD, the term TN464 will mean any TN464C or later suffix UDS1 circuit pack. If part of this section refers to a specific suffix TN464 board, it will be noted as such.

The UDS1 maintenance strategy includes logging in-line errors reported by the UDS1 circuit pack, running tests for error diagnosis and recovery, and raising or clearing maintenance alarms.

TN464 circuit packs support the following:

- Digital Tie, CO, and DID trunks
- DS1 off-premises (OPS) lines
- Narrowband and wideband access endpoint ports
- ISDN-PRI trunks and accompanying signaling channel
- PRI endpoint ports (PE-BCHL) and accompanying signaling channel

The TN464 supports digital Tie, CO, and DID trunks, and OPS lines. On-board firmware performs call control signaling for the Tie, CO and DID trunks and OPS lines. ISDN-PRI trunk and PRI-endpoint signaling (Q.921, Q.931) is received and generated by system software and is transmitted on a system link through the TN1655 Packet Interface and packet bus to the UDS1 where it is placed on the D channel. Signaling over the DS1 link has to be synchronized between the transmitting and receiving ends to ensure error-free communication. See SYNC (Port-Network Synchronization) on page 1751 in this MO for details.

Each trunk, line, or endpoint has its own maintenance strategy, but all depend on the health of the UDS1 Interface circuit pack. See the following MOs for details: ''TIE-DS1 (DS1 Tie Trunk)'', CO-DS1 (DS1 CO Trunk) on page 623, DID-DS1 (Direct Inward Dial Trunk) on page 684, OPS-LINE (DS1 Off-Premises Station Line) on page 1361, ISDN-TRK (DS1 ISDN Trunk) on page 1141, ISDN-PLK (ISDN-PRI Signaling Link Port) on page 1121, ISDN-SGR (ISDN-PRI Signaling Group) on page 1127, ''WAE-PORT (Wideband Access Endpoint Port)'' and PE-BCHL (PRI Endpoint Port) on page 1392. The maintenance strategy for the TN464 UDS1 Interface circuit pack (UDS1-BD) is very similar to the maintenance strategy for the TN767 DS1 Interface circuit pack (DS1-BD). The same commands are used for administering and testing the boards. The differences in maintenance strategy between the boards result from the UDS1 circuit pack's direct interface to the Packet bus used for ISDN-PRI signaling (ISDN-LNK). While both the TN464 and TN767 can support ISDN-PRI B channels, ISDN-PRI D-channel signaling applications require a TN464 UDS1 circuit pack.

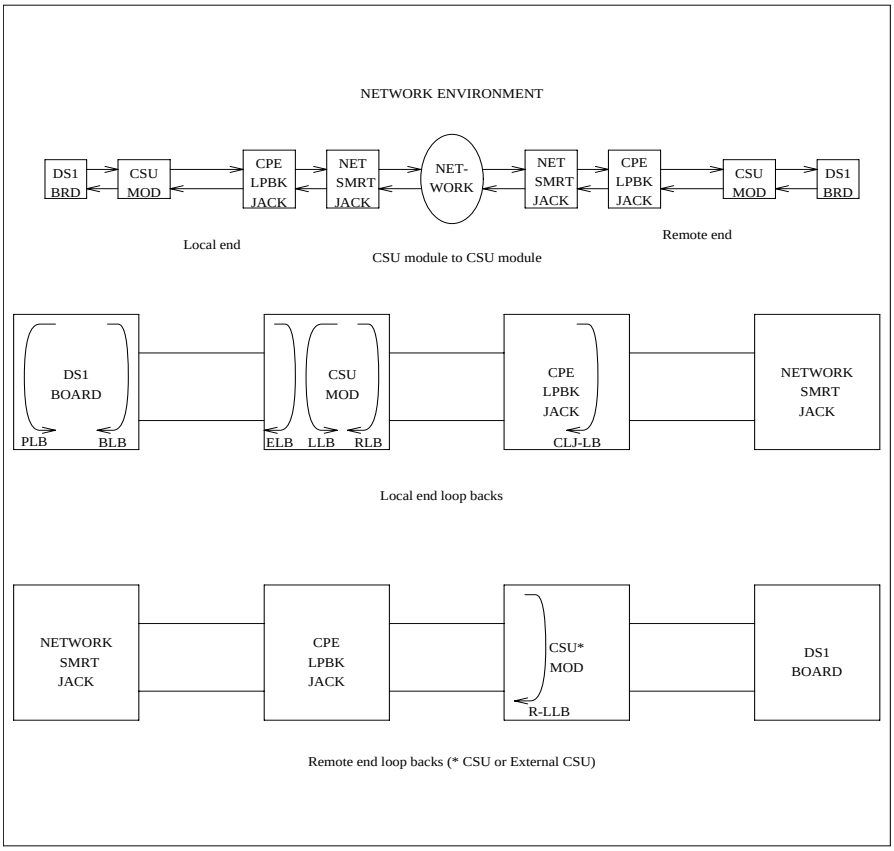
The UDS1 circuit pack, combined with the 120A1 CSU module forms an Enhanced Integrated CSU. The 120A1 CSU module, when combined with the functionality provided by the TN464F hardware and firmware, and switch software, provides functionality equivalent to an external stand-alone ESF T1 CSU. The 120A1 CSU module connects to the UDS1 circuit pack on the I/O connector panel behind the port carrier. Throughout this MO, the term 120A1 will mean a 120A1 or later suffix CSU module.

The Enhanced Integrated CSU is for use in the United States of America with 1.544-Mbps DS1 service. For further details on the 120A1 CSU module refer to *DEFINITY® Communications System Generic 1, Generic 2 and Generic 3 V1 and 2 – Integrated Channel Service Unit (CSU) Module Installation and Operation, 555-230-193*.

The UDS1-BD and 120A1 CSU module support on-demand loop-back tests that assist in the detection of faults between the UDS1-BD circuit pack and the CSU module, between the Integrated CSU and the optional Customer Premises Loop-Back Jack, or between the Integrated CSU and remote CSU.

These loop-back tests are explained in detail later in this UDS1-BD MO, but Figure 150 gives a high level overview of the loop-back points.

Figure 150: High Level Overview Of Loopback Points



The following list of acronym definitions are for the Figure 150, High Level Overview Of Loopback Points, on page 1959:

- PLB = Payload Loopback
- BLB = Board Loopback
- ELB = Equipment Loopback
- LLB = Line Loopback
- RLB = Repeater Loopback
- CLJ = Loop-Back Jack Loopback
- R-LLB = Remote Line Loopback
- SMRT = Smart Jack
- LPBK = Loopback

Circuit Pack Administration and Options

The DS1 configuration for each circuit pack is administered on the ***DS1 Circuit Pack*** screen. `Bit Rate` is set to 1.544 Mbps for 24-channel systems, and 2.048 Mbps for 32-channel systems. `Country Protocol` is used to drive layer-3 protocol decisions based on PRI specifications specific to a given country (not those related to specific features). Different UDS1 circuit packs may be administered with different Country Protocols, allowing the switch to act as a gateway between two incompatible ISDN-PRI implementations (for example, between two different countries). US systems use country protocol 1.

Set `Near-End CSU Type` to **`other`** for no CSU installed or for an external CSU such as an ESF T1 CSU, or set to **`integrated`** for the 120A1 CSU module or the 401A T1 sync splitter. Setting the field to **`integrated`** causes additional fields to appear for administering the Enhanced Integrated CSU module. Set `E1 Sync-Splitter` to **`y`** if a 402A or 403A E1 sync splitter is used to provide timing to an ATM switch. Set `Echo Cancellation` to **`y`** if the echo cancellation right-to-use feature is enabled and the TN464GP/TN2464BP or later suffix board is to supply echo cancellation.

> **NOTE:**
> Set the `Echo Cancellation Plan` on the `EC Configuration field` of the ***DS1 Circuit Pack*** screen. Note that Plan 1 uses a 96 ms echo tail and introduces 6db of loss for additional cancellation.

In addition, other fields define such parameters as framing modes, line coding, companding mode and so on. For further details refer to *DEFINITY® Communications System Generic 1, Generic 2 and Generic 3 V1 and 2 – Integrated Channel Service Unit (CSU) Module Installation and Operation, 555-230-193.*

Two option jumpers located on the side of the TN464C/D circuit pack must be installed correctly. The figures on the following page show how to configure the circuit pack for 24- or 32-channel DS1, and for 75*W (coaxial) or 120*W trunk connections. The channel selection must match the parameters administered on the corresponding **DS1 Circuit Pack** screen. (US applications use 24 Channels.)

Figure 151: TN464C/D DS1 Option Jumpers

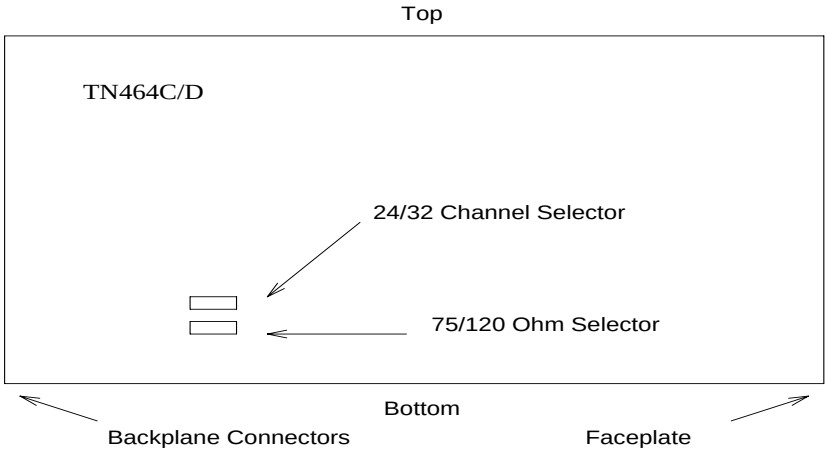
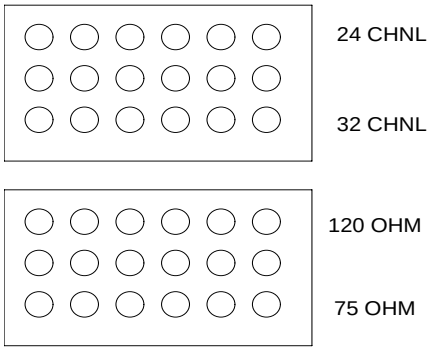


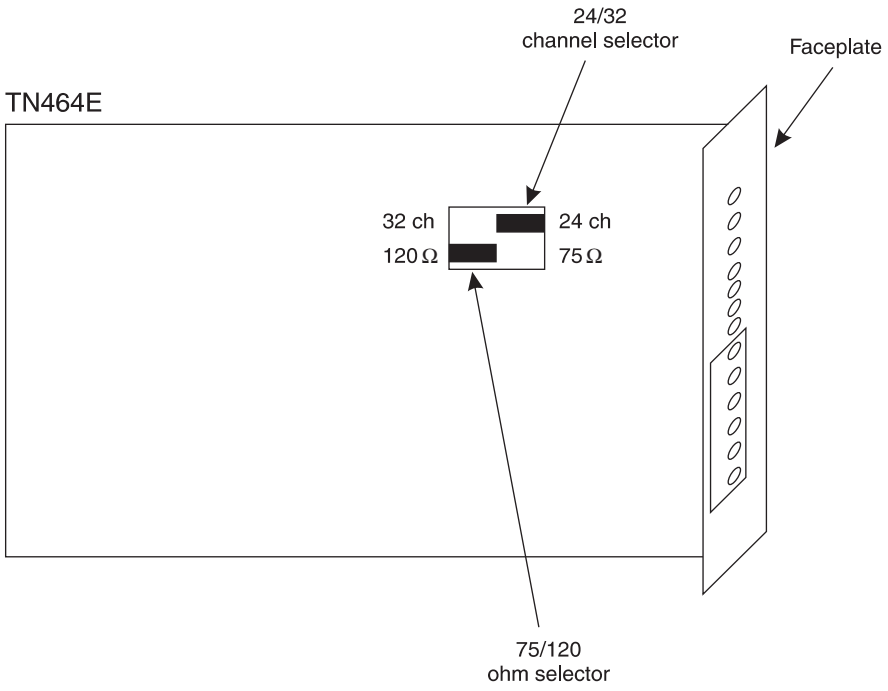
Figure 152: TN464C/D DS1 Option Jumpers (Continued)



Insert the jumpers into the blocks so as to join the center row of pins and the row designating the desired options.

The option switch located on the component side of the TN464E/F circuit pack must be set correctly. Figure 153 shows how to configure the circuit pack for 24-channel or 32-channel DS1. The channel selection must match the parameters administered on the corresponding ***DS1 Circuit Pack*** screen. (US applications use 24 Channels.)

Figure 153: TN464E/F DS1 Option switches



Firmware Download Feature

Firmware Download enables you to download new firmware to one or more UDS1 circuit boards residing in the system. The download image is copied onto a source (C-LAN) board, using FTP. The image is then copied to a target board's flash memory over the TDM bus. The transfer of the download image from the source board to a target board is done under switch software's control. This process is initiated using the SAT interface.

If the firmware download fails for this circuit pack, an error is logged, and an alarm raised (see Error Type 174 for this MO). See FW-DWNLD (Firmware Download) on page 1013 for more information and for the firmware download procedure.

Error Log Entries and Test to Clear Values

Table 844: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS*
1(a)	0	Circuit pack removed or SAKI test (#53)	WARNING[2] MINOR	ON	
18(b)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board** *UUCSS*

Table 844: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
23(c)	0		WARNING	OFF	**add ds1** *UUCSS*
125(d)	none 3	None	WARNING[3] MINOR	ON	
257	65535	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **l r 20**
257(e)	Any	None			
513(f)	Any		WARNING[3] MINOR	ON	
514(g)	46086		WARNING[3] MINOR	ON	
769(h)	46085		WARNING[3] MINOR	ON	
770(i)	46096		WARNING[3] MINOR	ON	
1025(e)	4363	NPE Audit test (#50)			
1281	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING[3] MINOR	OFF	test board *UUCSS*
1300(j)	Any	Loss Of Signal Alarm Inquiry test (#138)	WARNING	OFF	**test board** *UUCSS*
1301(k)	Any	Loss Of Signal Alarm Inquiry test (#138)	WARNING	OFF	**test board** *UUCSS*
1302(l)	Any	Loss Of Signal Alarm Inquiry test (#138)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
1303 (m)	Any	Loss Of Signal Alarm Inquiry test (#138)	WARNING[3] MINOR	ON	**test board** *UUCSS*
1310(n)	Any	Board Loopback test (#1209)	MINOR	ON	**test ds1-loop** *UUCSS* **ds1/csu-loopback-tests**
1311(o)	Any	Equipment Loopback test (#1210)	WARNING[3] MINOR	OFF	**test ds1-loop** *UUCSS* **ds1/csu-loopback-tests**
1312(p)	Any	Repeater Loopback test (#1211)	WARNING[3] MINOR	OFF	**test ds1-loop** *UUCSS* **ds1/csu-loopback-tests**
1313(q)	Any	CPE Loop-Back Jack test (#1212)	WARNING[3] MINOR	OFF	**test ds1-loop** *UUCSS* **end-loopback/span-test**
1314(r)	Any	Far CSU Loopback test (#1213)	WARNING[3] MINOR	OFF	**test ds1-loop** *UUCSS* **end-loopback/span-test**
1320	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING[3] MINOR	OFF	**test board** *UUCSS*

Table 844: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1321	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
1322	Any	Loss of Signal Alarm Inquiry test (#138)	MINOR	ON	**test board** *UUCSS*
1323	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
1324	Any	Loss of Signal Alarm Inquiry test (#138)	WARNING	OFF	**test board** *UUCSS*
1400 1401(s)	Any	Loss of Signal Alarm Inquiry test (#138) and Echo Cancellation test (#1420)	MINOR	ON	**test board** *UUCSS*
1537(t)	46082		WARNING[3] MINOR	ON	
1538(u)	Any		WARNING[3] MINOR	ON	
1793	Any	Blue Alarm Inquiry test (#139)	WARNING MINOR MAJOR[4]	OFF	**test board** *UUCSS*
1794	Any	Blue Alarm Inquiry test (#139)	WARNING MINOR MAJOR[4]	OFF	**test board** *UUCSS*
1795	Any	Blue Alarm Inquiry test (#139)	WARNING MINOR MAJOR[4]	OFF	**test board** *UUCSS*
2049	Any	Red Alarm Inquiry test (#140)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
2305	Any	Yellow Alarm Inquiry test (#141)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
2306	Any	Yellow Alarm Inquiry test (#141)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
2561	Any	Major Alarm Inquiry test (#142)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
2817		Minor Alarm Inquiry test (#143)	WARNING[3] MINOR	OFF	**test board** *UUCSS*
3073 to 3160 (v)	Any	Slip Alarm Inquiry test (#144)	WARNING[3] MINOR	OFF	**test board** *UUCSS* **r 6**
3330(w)	46083		WARNING[3] MINOR	ON	

Table 844: DS1 Interface Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3585 to 3601 (x)	Any	Misframe Alarm Inquiry test (#145)	WARNING[3] MINOR	OFF	**test board** *UUCSS* **r 6**
3840(y)	Any	None			
3841(z	4358				
3842 (aa)	46097				
3843 (ab)	46081				
3900 (ac)	Any	CPE Loop-Back Jack test (#1212)			
3901 (ad)	Any	Far CSU Loopback test (#1213)			
3902 (ae)	Any	One-Way Span test (#1214)			
3999 (af)	Any	None			

4 of 4

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2 If ports are assigned to the circuit pack, then a minor alarm is raised. If no ports are assigned to the circuit pack, then a warning alarm is raised. The alarm is raised after the circuit pack has been missing for a period of 15 minutes. Warning alarms are also raised against any ports administered on the circuit pack.

3 Minor alarms on this MO may be downgraded to Warning based on values in **set options**.

4 Major alarms on this MO may be downgraded to minor or warning alarms based on values set in **set options**.

Error Notes:

a **Error Type 1** — Indicates that the circuit pack has stopped functioning or is not fully administered. The alarm is logged about 15 minutes after the circuit pack has been removed or 11 minutes after the SAKI test (#53) fails.

To be fully administered, a UDS1 circuit pack must meet all of the following conditions:

1 Have an entry in the circuit plan using **change circuit-pack**

2 Be administered using **add ds1** ***UUCSS***

3 Be physically inserted into the correct slot

If the circuit pack has an entry in the circuit plan and either of the other conditions are not met, a MINOR alarm is logged. To resolve the error:

- Make sure that every condition for administration is met and that a functioning UDS1 circuit pack is inserted in the correct slot

  or

- Completely remove the UDS1-BD from the system:

  a Remove any administered DS1 trunks, access endpoints or PRI endpoints associated with the circuit pack from their trunk groups.

  b Execute **remove ds1 *UUCSS*** and **change circuit-pack *UUCSS***.

If every administration condition is met for this circuit pack and the red LED is still on, follow the instructions for LED alarms without Alarm Log entry or with Error Type 1 on page 27.

b **Error Type 18** — The UDS1 Interface circuit pack was busied out by **busyout board *UUCSS***.

c **Error Type 23** — The UDS1-BD circuit pack is not completely administered. To be fully administered, the UDS1 circuit pack must:

1 Have an entry in the circuit plan using **change circuit-pack**

2 Be administered using **add ds1 *UUCSS***

3 Be physically inserted into the correct slot

A DS1 (UDS1-BD and DS1-BD) differs from most circuit packs in that inserting the circuit pack into the switch is not enough to make the board usable. It must also be administered with **add ds1**.

d **Error Type 125: No Aux Data** — An incorrect circuit pack is inserted in the slot where the USD1 circuit pack is logically administered. To resolve this problem, do one of the following:

- Remove the incorrect circuit pack, and insert the logically administered circuit pack.
- Use **change circuit-pack** to re-administer this slot to match the circuit pack inserted.

Aux Data 3 — The 24-/32-channel option jumper setting on the circuit pack does not match the option set on the ***DS1 Circuit Pack*** administration screen. The circuit pack must be physically removed to see the setting of the jumper.

e **Error Type 257** — Associated with the Common Port Circuit Pack Maintenance test. See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 for details.

f **Error Type 513** — The UDS1 Interface circuit pack has detected a transient hardware problem. The value in the Aux Data field indicates the type of hardware problem:

Aux Data	Problem
4352	External RAM failure
4353	Internal RAM failure
4355	Internal ROM failure

If the UDS1 board detects only one of these hardware problems, then the error will disappear when none of these faults are detected for 10 minutes. If the same Aux Data value is logged more than once in a 24-hour period, the circuit pack should be replaced.

g **Error Type 514** — LAN External RAM Error. This error occurs when there is a hardware fault in the server's external RAM. The RAM is used for message buffering to and from the Packet bus. This error should not occur frequently. If it does (10 times within 30 minutes), the circuit pack should be replaced.

h **Error Type 769** — Transmit FIFO Underflow Error. This error occurs when the circuit pack cannot find the "end of frame" bit when transmitting a frame to the Packet bus. An alarm is raised if this error occurs three times within 10 minutes. Clear the alarm using the following commands: **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long**, **release board *UUCSS***. If the error recurs within 10 minutes, replace the circuit pack.

i **Error Type 770** — Unable to Write LAN Translation RAM Error. This error occurs when a call is aborted because there are no available translation RAM locations for the call connection attempt. An alarm is raised if this error occurs two times within 10 minutes. Clear the alarm using the following commands: **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long**, **release board *UUCSS***. If the error recurs within 10 minutes, replace the circuit pack.

j **Error Type 1300** — CSU module/T1 sync splitter missing or E1 synchronization splitter (E1SS) missing.

CSU module/T1 sync splitter missing: The `Near-End CSU Type` field on the ***add ds1*** screen is **`integrated`** but the 120A1 CSU module or the 401A T1 sync splitter is not physically connected (or is improperly connected) to the UDS1 board behind the port carrier.

If using the 120A1 CSU module or the 401A T1 sync splitter, plug (or replug) the CSU module/T1 sync splitter into the UDS1 circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the `Near-End CSU Type` field using the ***change ds1*** screen to **`other`**.

If this error remains after plugging the CSU module/T1 sync splitter into the board's connector, there could be a problem with the I/O connector panel.

E1 synchronization splitter missing: The `E1 Sync-Splitter` field on the ***add ds1*** screen is **`y`**, but the 402A or 403A E1 synchronization splitter is not physically connected (or is improperly connected) to the UDS1 board behind the port carrier.

If using the 402A or 403A E1 synchronization splitter, plug (or replug) the E1SS into the UDS1 circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the `E1 Sync-Splitter` field using the ***change ds1*** screen to **`n`**.

If this error remains after plugging the E1SS into the board's connector, there could be a problem with the I/O connector panel.

k **Error Type 1301** — CSU module/T1 sync splitter not expected or E1 synchronization splitter not expected.

CSU Module/T1 Sync Splitter not expected: The 120A1 CSU module or the 401A T1 sync splitter is physically connected to the UDS1 board behind the port carrier, but the `Near-End CSU Type` field on the ***add ds1*** screen is not set to **`integrated`**.

If the 120A1 CSU module or the 401A T1 sync splitter is to be used, use **`change ds1`** to set the `Near-End CSU Type` field to **`integrated`**. Otherwise, physically remove the 120A1 CSU module or the 401A T1 sync splitter from the back of the port carrier.

E1 synchronization splitter not expected: The 402A or 403A E1 synchronization splitter is physically connected to the UDS1 board behind the port carrier, but the `E1 Sync-Splitter` field on the ***add ds1*** screen is not set to **`y`**.

If the 402A or 403A E1 synchronization splitter is to be used, use **`change ds1`** to set the `E1 Sync-Splitter` field to **`y`**. Otherwise, physically remove the 402A or 403A E1 synchronization splitter from the back of the port carrier.

l **Error Type 1302** — DS1 configuration error. Attempting to use the 120A1 CSU module with a UDS1 circuit pack that is configured for 32-channel (2.048-Mbps) operation. The CSU module only works with a DS1 board configured for 24-channel (1.544-Mbps) operation in the United States of America.

m **Error Type 1303** — DS1 circuit pack suffix incorrect for CSU module/T1 sync splitter or for E1 synchronization splitter.

DS1 circuit pack suffix incorrect for CSU module/T1 sync splitter: The `Near-End CSU Type` field on the ***add ds1*** screen is set to **`integrated`** but the DS1 circuit pack is not a TN464F or later suffix UDS1 board.

If the 120A1 CSU module or the 401A T1 sync splitter is to be used, remove the circuit pack and replace it with a TN464F or later suffix board. Otherwise, use **change ds1** to set the `Near-End CSU Type` field to **`other`**.

DS1 circuit pack suffix incorrect for E1 synchronization splitter: The `E1 Sync-Splitter` field on the ***add ds1*** screen is set to **`y`** but the DS1 circuit pack is not a TN464F or later suffix UDS1 board.

If the 402A or 403A E1 synchronization splitter is to be used, remove the circuit pack and replace it with a TN464F or later suffix board. Otherwise, use **change ds1** to set the `E1 Sync-Splitter` field to **`n`**.

n **Error Type 1310** — BLB failure. This error occurs when the DS1 Board Loopback (BLB) demand test fails. Repeat the test using **busyout board *UUCSS*, test ds1-loop *UUCSS* ds1/csu-loopback-tests, release board *UUCSS***. If the BLB test continues to fail, replace the TN464F circuit pack.

o **Error Type 1311** — ELB failure. This error occurs when the Equipment Loopback (ELB) test fails for the Integrated CSU (I-CSU) module/T1 sync splitter or for the 402A or 403A E1 synchronization splitter. This test is executed by the I-CSU/E1SS during I-CSU/E1SS power-up/reset (i.e.- UDS1 board physically inserted and 120A1 CSU module, the 401A T1 sync splitter, or the 402A or 403A E1SS is already installed) or when the 120A1 CSU module, the 401A T1 sync splitter, or the 402A or 403A E1SS is plugged on to an already initialized UDS1 DS1 board.

> **NOTE:**
> For the **I-CSU/T1 sync splitter only**, the ELB test is also executed as part of **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. Try to clear the alarm using **busyout board *UUCSS*, test ds1-loop *UUCSS* ds1/csu-loopback-tests,** and **release board *UUCSS***. If the ELB test continues to fail, then either the UDS1 board, the CSU module, or the I/O cable between the backplane and the CSU module, or any combination thereof, failed. Try to isolate where the failure is occurring by re-executing the test and by replacing one piece of hardware at a time.

p **Error Type 1312** — RLB failure. This error occurs when the Repeater Loopback (RLB) test fails for the Integrated CSU (I-CSU) module/T1 sync splitter or for the 402A or 403A E1 synchronization splitter. This test is executed by the I-CSU/E1SS during I-CSU/E1SS power-up/reset (i.e., DS1 board physically inserted and 120A1 CSU module or the 401A T1 sync splitter, or the 402A or 403A E1SS is already installed) or when the 120A1 CSU module or the 401A T1 sync splitter, or the 402A or 403A E1SS is plugged on to an already initialized DS1 board.

> **NOTE:**
> For the **I-CSU/T1 sync splitter** only, the RLB test is also executed as part of the **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. Try to clear the alarm using **busyout board *UUCSS*, test ds1-loop *UUCSS* ds1/csu-loopback-tests,** and **release board *UUCSS***. If the RLB test continues to fail, replace the CSU module.

q **Error Type 1313** — CPE Loop-Back Jack deactivation error. This error occurs when the UDS1 circuit pack could not deactivate a CPE Loop-Back Jack on power-up/reset or upon software request.

Try to clear the alarm using **busyout board *UUCSS*, test ds1-loop *UUCSS* end-loopback/span-test,** and **release board *UUCSS***. If the attempt to deactivate the CPE Loop-Back Jack continues to fail, other steps must be taken to deactivate the loopback.

r **Error Type 1314** — Far CSU Loopback deactivation error. This error occurs when the UDS1 circuit pack could not deactivate a far-end CSU loop back on power-up/reset or upon software request.

Try to clear the alarm using **busyout board *UUCSS*, test ds1-loop *UUCSS* end-loopback/span-test,** and **release board *UUCSS***. If the attempt to deactivate the Far CSU loop back continues to fail, escalate the problem.

s **Error Types 1400, 1401 — Echo Cancellation errors** are logged when:

- Error 1400 - Echo canceller function failed. The Echo Canceller Function test, which is executed by firmware, failed.
- Error 1401 - Echo canceller memory failed. The Echo Canceller Memory test, which is executed by firmware, failed.

Echo Cancellation is no longer being supplied by the board. Clear the alarm using the following commands: **busyout board *UUCSS***, **test board *UUCSS* long**, and **release board *UUCSS***. If Test #1420 (Echo Canceler test) fails, replace the circuit pack.

t **Error type 1537** — LAN Bus Timeout Error. This error occurs when the circuit pack transmits too many bytes on the LAN bus for a single frame. This condition may be caused by an on-board fault or by faulty data received on one of the circuit pack's external ports. If any of the ports on this circuit pack are alarmed, refer to the repair procedures for those MOs.

If the error occurs three times within 10 minutes, the board is isolated from the Packet bus and the board alarmed. To clear the alarm and restore the board to the Packet bus, use **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long**, and **release board *UUCSS***.

If the problem persists, and there are no PKT-BUS alarms or port alarms, then replace the circuit pack.

u **Error Type 1538** — The hyperactive circuit pack is out-of-service and may exhibit one or more of the following symptoms:

- The common circuit pack level tests such as Test #50 and/or Test #52 abort with error code 2000.
- The tests run on the ports of this circuit pack return a NO-BOARD result.
- A busyout/release of the circuit pack has no effect on test results.
- A **list configuration** shows that the circuit pack and ports are properly installed.

The circuit pack is isolated from the system and every trunk or port on this circuit pack is placed into the out-of-service state. The system will try to restore the circuit pack within 20-30 minutes. When no faults are detected for 20-30 minutes, the UDS1 Interface circuit pack is restored to normal operation. Every trunk or port of the UDS1 Interface circuit pack is then returned to the in-service state.

If either the board is not restored to normal operation or the error recurs after the board was restored to normal operation, escalate the problem.

v **Error Types 3073 to 3160** — For later releases of G3V4 and beyond, only Error Type 3073 shows that this board is receiving slips and the AUX data shows the last slip count reported.

w **Error Type 3330** — LAN Critical Error. A critical failure has been detected in the Packet bus interface of the circuit pack. This failure may be due to an on-board fault or a Packet bus fault. If the Packet bus is alarmed, see PKT-BUS (Packet Bus - S8100) on page 1414 for recommended repair procedures.

This error isolates the board from the Packet bus and raises an alarm. If the Packet bus is not alarmed, enter **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS***, and **release board *UUCSS***. This should clear the alarm and restore the board to the Packet bus.

If the problem persists, and there are no PKT-BUS alarms, then replace the circuit pack.

x **Error Types 3585 to 3601** — For later releases of G3V4 and beyond, only Error Type 3585 shows that this board is receiving misframes, and the AUX Data shows the last misframe count reported.

y **Error Type 3840** — Not service-affecting. No action is required. These errors are reported by the circuit pack when it receives a bad control channel message from the switch. The auxiliary data identifies the following error events:

Aux Data	Event
4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link

z **Error Type 3841** — The UDS1 Interface circuit pack has detected a transient hardware logic error (for example, program logic inconsistency). This error will disappear when no faults are detected for 100 minutes. The value in Aux Data indicates the type of hardware problem.

aa **Error Type 3842** — Bad Translation RAM Location Found Error. This error is not service-affecting. No action is required. A Bad Translation RAM is detected, but the call continues by using another translation location.

ab **Error Type 3843** — LAN Receive Parity Error. This error occurs when the circuit pack detects an error in a received frame from the Packet bus. These errors are most likely caused by a Packet bus problem, but may be due to a circuit pack fault.

See PKT-BUS (Packet Bus - S8100) on page 1414 to determine whether the problem is isolated to this circuit pack or is caused by Packet bus faults.

ac **Error Type 3900** — Provides status information about a CPE Loop-Back Jack test. The value in the Aux Data field indicates the status of the loop-back test.

Aux Data	Test Status
1	Currently running
2	Failed because loop back could not be activated
3	Failed because test pattern could not be detected
4	Terminated

ad **Error Type 3901** — Provides status information about a Far CSU Loopback test. The value in the Aux Data field indicates the status of the loop-back test.

Aux Data	Test Status
1	Currently running
2	Failed because loop back could not be activated
3	Failed because test pattern could not be detected
4	Terminated

ae **Error Type 3902** — Provides status information about a One-Way Span test. The value in the Aux Data field indicates the status of the span test.

Aux Data	Test Status
1	Currently running
2	Failed because test could not be activated
3	Test pattern was not received from the far end
4	Terminated

NOTE:
G700: If the One-Way Span test is run between a circuit pack and an MM710 DS1 Interface Media Module on a G700 Media Gateway, the test will fail, because the MM710 does not frame-align its test pattern.

af **Error Type 3999** — Indicates that the circuit pack sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack was taken out-of-service due to hyperactivity. If Error Type 1538 is absent, then the circuit pack was not taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack is being lightly used, it may indicate a problem with the circuit pack or the equipment attached to it.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order they are presented in Table 845. By clearing error codes associated with the Echo Cancellation test (#1420), you may also clear errors generated from other tests in the testing sequence.

Table 845: System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop	D/ND[1]
Echo Cancellation test (#1420)		X			D
NPE Connection Audit test (#50)		X			ND
Control Channel Loop test (#52)		X			ND
Loss of Signal Alarm Inquiry test (#138)	X	X			ND

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Table 845: System Technician-Demanded Tests

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	test ds1-loop	D/ND[1]
Blue Alarm Inquiry test (#139)	X	X			ND
Red Alarm Inquiry test (#140)	X	X			ND
Yellow Alarm Inquiry test (#141)	X	X			ND
Major Alarm Inquiry test (#142)	X	X			ND
Minor Alarm Inquiry test (#143)	X	X			ND
Slip Alarm Inquiry test (#144)	X	X			ND
Misframe Alarm Inquiry test (#145)	X	X			ND
Translation Update test (#146)	X	X			ND
ICSU Status LEDs test (#1227)	X	X			ND
SAKI Sanity test (#53)			X		D
Internal Loop-Around test (#135)			X		D
DS1/CSU Loopback tests: DS1 Board Loopback test (#1209) CSU Equipment Loopback test (#1210) CSU Repeater Loopback test (#1211)				X X X	D D D
CPE Loop-Back Jack test (#1212)				X	D
Far CSU Loopback test (#1213)				X	D
One-Way Span test (#1214)				X	D
Inject Single Bit Error (#1215)				X	D
End Loopback/Span test (#1216)				X	D

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1 D = Destructive; ND = Nondestructive

NPE Connection Audit Test (#50)

The system sends the circuit pack's on-board microprocessor a message to update the network-connectivity translation for its SCOTCH-NPE chip.

Table 846: Test #50 NPE Connection Audit Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1019	ABORT	The test aborted because a test was already running on the port. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 846: Test #50 NPE Connection Audit Test

Error Code	Test Result	Description / Recommendation
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The circuit pack's SCOTCH-NPE chip has been updated with its translation.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long.** This should re-establish the linkage between the internal ID and the port.

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Control Channel Loop-Around Test (#52)

This test queries the circuit pack for its code and vintage and verifies its records.

Table 847: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The circuit pack failed to return the its code or vintage. **1** Retry the command up to 5 times. **2** If the problem continues and if the circuit pack is a port circuit pack, replace the circuit pack. **S8100**: Otherwise, if the circuit pack is part of the SPE, use the procedure described in Reseating and replacing circuit packs in Maintenance Procedures (555-245-103). **3** Retry the command several times up to 5 times.
	PASS	Communication with this circuit pack is successful.

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Table 847: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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SAKI Sanity Test (#53)

This test is **destructive**.

This test resets the circuit pack. The test is highly destructive and can only be initiated with **reset board *UUCSS***.

Table 848: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry **reset board** at 1-minute intervals up to 5 times.
1005	ABORT	Wrong circuit pack configuration to run this test. This error applies only to DS1 Interface circuit packs. It means the DS1 Interface circuit pack is providing timing for the system, and therefore, it cannot be reset without major system disruptions. **1** If the circuit pack needs to be reset, then set synchronization to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack and try again. See SYNC (Port-Network Synchronization) on page 1751.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack. **2** Execute **reset board** again.

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Table 848: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	System resources required for this test are not available. **1** Retry the **reset board** at 1-minute intervals up to 5 times.
1	FAIL	The circuit pack failed to reset.
2	FAIL	The circuit pack failed to restart. **1** Execute **reset board** again. **2** If the problem persists, replace the circuit pack.
	PASS	The circuit pack initializes correctly. **1** Run the short test sequence.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Internal Loop-Around Test (#135)

This test is **destructive**.

The Internal Loop-Around test is run by looping the transmitted DS1 bit stream back into the UDS1 board's receiver. The loop occurs just before the DS1 facility interface. The test is highly destructive and can only be initiated by **reset board *UUCSS***.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the Internal Loop-Around test. When the Internal Loop-Around test is initiated, maintenance software sends appropriate messages to the UDS1 Interface circuit pack to start the test. The test uses the Tone Generator and Tone Detector to exercise a bit-pattern consistency test for every port. If the transmitted and received bit patterns on a trunk or port are different, the test fails.

When the test completes, the maintenance software sends a stop loop around message to the UDS1 Interface circuit pack to put the circuit pack back into the normal operation mode. Every trunk or port of the UDS1 Interface circuit pack is restored to the in-service state after **release board** is entered.

Table 849: Test #135 Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. **1** If system has no TDM-BUS errors and is not handling heavy traffic, repeat test at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be oversized for the number of Tone Detectors present or some Tone Detectors may be out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry **reset board** at 1-minute intervals up to 5 times.
1004	ABORT	Received an incoming call on a port of the UDS1 circuit pack during the test. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack to out-of-service state. **2** Retry **reset board** at 1-minute intervals up to 5 times.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry **reset board**
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Therefore, it cannot be reset without major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another UDS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue **disable synchronization-switch**. **2** Issue **set synchronization *UUCSS***. **3** Issue **enable synchronization-switch**.
2000	ABORT	Response to the test request was not received within the allowable time period. If Error Type 1538 is present in the Error Log, follow the maintenance strategy recommended for this error type.
2012	ABORT	Internal system error **1** Retry the **reset board** command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry **reset board** at 1-minute intervals up to 5 times.

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Table 849: Test #135 Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
	FAIL	The UDS1 Interface circuit pack failed in the Internal Loop-Around test. If the UDS1 connects to a T1 network facility or another switch: **1** Retry **reset board** at 1-minute intervals up to 5 times. **2** Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **4** Check the physical connectivity of DS1 Interface circuit packs and cable. **5** Replace the local UDS1 Interface circuit pack and repeat the test. **6** Contact T1 Network Service to diagnose the remote DS1 endpoint.
	FAIL *(cont'd)*	If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: **1** Retry **reset board** at 1-minute intervals up to 5 times. **2** Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **4** Investigate the maintenance status of the line-side terminating device. Obtain the error seconds measurement on the terminating device (if possible). Refer to the line-side terminating device operating manual for information. **5** Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. If the error seconds measurement is severe, investigate premise distribution system wiring for noise and distance limitation. **6** Replace the local UDS1 Interface circuit pack, and repeat the test. **7** Contact the vendor of the line-side terminating device to diagnose the equipment.
	PASS	Every administered trunk or port of the UDS1 Interface circuit pack passes the Internal Loop-Around test. The bit pattern consistency test is executed successfully over the path that covers a DS1 port, cable, and the external NCTE device.

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Table 849: Test #135 Internal Loop-Around Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Loss of Signal Alarm Inquiry Test (#138)

This test verifies the synchronization status, echo cancellation, and continuity of the DS1 link. The Loss of Signal alarm indicates that the UDS1 Interface circuit pack is unable to derive the synchronization clock from the DS1 facility. When the UDS1 Interface circuit pack detects a Loss of Signal alarm, it stops providing the synchronization clock for the system, if it is administered as a timing source, and transmits a Yellow alarm to the remote DS1 endpoint.

When the Loss of Signal alarm is confirmed, maintenance software places every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. The inquiry test will run every 10 minutes until the loss of signal has been restored.

The UDS1 Interface circuit pack raises a Loss of Signal alarm after the signal has been lost for about 1 second. It will not retire the alarm until the signal has returned for about 10 seconds.

120A1 CSU Module/Sync Splitter

This test is also used to maintain the 120A1 CSU module or the 401A T1 sync splitter, and the 402A or 403A E1 synchronization splitter. The CSU module, when combined with the functionality provided by the UDS1 circuit pack, provides functionality equivalent to an external stand-alone ESF T1 CSU. The combination of the UDS1 and 120A1 CSU module is known as an Enhanced Integrated CSU (I-CSU).

The 401A T1 synchronization splitter, when combined with the functionality provided by the UDS1 circuit pack, allows an ATM switch to derive its timing from a T1 connected to the UDS1 in the S8700 Multi-Connect.

The 402A or 403A E1 synchronization splitter, when combined with the functionality provided by the UDS1 circuit pack, allows an ATM switch to derive its timing from an E1 connected to the UDS1 in the S8700 Multi-Connect.

If a UDS1 circuit pack detects certain I-CSU/Sync Splitter hardware errors, it notifies maintenance. When the maintenance subsystem receives notification of the I-CSU/Sync Splitter error, it executes the Loss of Signal Alarm Inquiry test (#138). The test queryies for a Loss of Signal alarm condition, and queries the UDS1 board to confirm the I-CSU/Sync Splitter error. A Minor or Warning alarm is raised depending on the severity of the I-CSU/Sync Splitter error. The trunks on the board may be taken out of service if the I-CSU/Sync Splitter error is deemed serious.

If a Loss Of Signal alarm and an I-CSU/Sync Splitter error co-exist, the Loss Of Signal alarm condition takes priority, and the board and all of its trunks are put in the out-of-service state. Errors are logged for both.

When the maintenance subsystem receives notification that the I-CSU/Sync Splitter hardware error condition no longer exists, maintenance restores the board and its trunks to their previous service state, if the alarm can be cleared (no other I-CSU/Sync Splitter errors or Loss Of Signal alarms exist).

Echo Cancellation

If the TN464GP/TN2464BP or later suffix UDS1 firmware detects a serious echo canceller hardware error, it notifies maintenance software. When the maintenance subsystem receives notification of the echo cancellation error, it executes this *Loss Of Signal Alarm Inquiry* test.

This test, in addition to querying for a loss-of-signal condition and ICSU errors, also queries the TN464GP/TN2464BP to confirm the echo canceller error. A minor alarm is raised if the error is confirmed. The board's trunks remain in-service since the board is still functional except for its echo-cancellation capability.

If a loss-of-signal condition co-exists with ICSU and/or echo-canceller errors, the loss of signal condition takes priority, and the board and every trunk on the board is put in the out-of-service state. Errors are logged, however, for each error type.

When the maintenance subsystem receives notification that the echo-canceller hardware's error condition no longer exists, the maintenance subsystem restores the board and its trunks to their previous service state, if the alarm can be cleared (no other ICSU errors or loss-of-signal conditions exist).

Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. • The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. • The tests run on the ports of this circuit pack are returning a no-board result. • A **busyout** or a **release** has no effect on the test results. • A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system tries to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 interface trunk is returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) are entered in the error log. In addition, many hardware errors are logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	UDS1 Interface circuit pack detects a Loss of Signal alarm. The physical link is broken or the remote DS1 endpoint is down. Every trunk or port of this UDS1 interface circuit pack is out-of-service. If the UDS1 Interface circuit pack is designated as the supplier of the system synchronization source, the system synchronization maintenance adopts a source elsewhere. See SYNC (Port-Network Synchronization) on page 1751 for details. If the UDS1 connects to a T1 network facility: **1** Check the physical connection of the UDS1 Interface circuit pack and the cable. If a CSU module or a Sync Splitter is physically connected to a UDS1-BD board behind the port carrier, check the physical connection of the CSU module/Sync Splitter and make sure the Network Interface cable is plugged into the CSU module's/Sync Splitter's NETWORK jack. **2** If the UDS1 Interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the UDS1 Interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: **1** Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. If a CSU module or Sync Splitter is physically connected to a UDS1-BD board behind the port carrier, check the physical connection of the CSU module/Sync Splitter and make sure the Network Interface cable is plugged into the CSU module's/Sync Splitter's NETWORK jack. **2** Contact the vendor of the line-side terminating device to diagnose the equipment.

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Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1300	FAIL	The CSU module/T1 sync splitter or the E1 Sync Splitter is missing. The CSU module/T1 sync splitter is missing: The `Near-End CSU Type` field on the ***add ds1*** screen has been administered as **`integrated`** but the 120A1 CSU module or the 401A T1 sync splitter is not physically connected to the UDS1 board behind the port carrier. **1** If using the 120A1 CSU module or the 401A T1 sync splitter, plug the CSU module/T1 sync splitter into the UDS1 circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the `Near-End CSU Type` field using the ***change ds1*** screen to **`other`**. **2** Run the test again. The E1 Sync Splitter is missing: The `E1 Sync-Splitter?` field on the ***add ds1*** screen has been administered as **`y`** but the 402A or 403A E1 Sync Splitter is not physically connected to the UDS1 board behind the port carrier. **1** If using the 402A or 403A E1 synchronization splitter, plug the E1SS into the UDS1 circuit pack's connector on the I/O connector panel on back of the carrier. Otherwise, set the `E1 Sync-Splitter` field using the ***change ds1*** screen to **`n`**. **2** Run the test again.
1301	FAIL	The 120A1 CSU module or the 401A T1 sync splitter, or the 402A or 403A E1 synchronization splitter is not expected. The 120A1 CSU module or the 401A T1 sync splitter is not expected: The 120A1 CSU module/T1 sync splitter is physically connected to the UDS1 board behind the port carrier, but the `Near-End CSU Type` field on the ***add ds1*** screen has not been administered as **`integrated`**. **1** If the 120A1 CSU module/T1 sync splitter is to be used, use **change ds1** to set the `Near-End CSU Type` field to **`integrated`**. Otherwise, physically remove the 120A1 CSU module/T1 sync splitter from the back of the port carrier. **2** Run the test again. The 402A or 403A E1 synchronization splitter is not expected: The 402A or 403A E1 synchronization splitter is physically connected to the UDS1 board behind the port carrier, but the `E1 Sync-Splitter?` field on the ***add ds1*** screen has not been administered as **`y`**. **1** If the 402A or 403A E1 synchronization splitter is to be used, use **change ds1** to change the `E1 Sync-Splitter` field to **`y`**. Otherwise, physically remove the 402A or 403A E1 synchronization splitter from the back of the port carrier. **2** Run the test again.

Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1302	FAIL	Attempting to use the 120A1 CSU module with a UDS1 circuit pack that is configured for 32-channel (2.048-Mbps) operation. The CSU module only works with a DS1 board configured for 24-channel (1.544-Mbps) operation in the United States of America. **1** If the 120A1 CSU module is to be used, physically remove the UDS1 circuit pack and reconfigure for 24-channel (1.544-Mbps) operation. **2** Reinsert the circuit pack and run the test again.
1303	FAIL	The DS1 circuit pack Suffix is incorrect for CSU module/T1 sync splitter or E1 Sync Splitter administration. The DS1 circuit pack Suffix is incorrect for CSU module/T1 sync splitter administration. The `Near-End CSU Type` field on the ***add ds1*** screen has been administered as **`integrated`** but the DS1 circuit pack is not a TN464F or later suffix UDS1 board. **1** If the CSU module/T1 sync splitter is to be used, and the `Near-End CSU Type` field is set to **`integrated`** to allow for CSU module/T1 sync splitter administration, remove the circuit pack and replace it with a TN464F or later suffix board. Otherwise, use **change ds1** to set the `Near-End CSU Type` field to **`other`**. The DS1 circuit pack Suffix is incorrect for E1 Sync Splitter administration. The `E1 Sync-Splitter?` field on the ***add ds1*** screen has been administered as **`y`** but the DS1 circuit pack is not a TN464F or later suffix UDS1 board. **1** If the E1 Sync Splitter is to be used, and the `E1 Sync-Splitter` field is set to **`y`** to allow for E1SS administration, remove the circuit pack and replace it with a TN464F or later suffix board. Otherwise, use **change ds1** to set the `E1 Sync-Splitter` field to **`n`**.
1310	FAIL	The DS1 Board Loopback (BLB) demand test (#1209) failed. **1** Repeat the test using **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the BLB test continues to fail, then replace the UDS1-BD circuit pack. **3** Run this test again.

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Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1311	FAIL	The Integrated CSU (I-CSU) Module Equipment Loopback (ELB) test (#1210) failed. This test is executed by the I-CSU during I-CSU power-up/reset (i.e., the UDS1 board is physically inserted and a CSU module or a Sync Splitter is already installed) or when the CSU module/Sync Splitter is plugged on to an already initialized DS1 board. The ELB test is also executed as part of **test ds1-loop *UUCSS* ds1/csu-loopback-tests** for the CSU module and T1 sync splitter. **1** Execute the **test ds1-loop *UUCSS* ds1/csu-loopback-tests** command. **2** If the ELB test continues to fail, then either the UDS1 board, the CSU module/T1 sync splitter, or the I/O cable between the backplane and the CSU module/T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. Replace the CSU module/T1 sync splitter and run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** again. **3** If the ELB test continues to fail, replace the UDS1 board, and run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** again. **4** If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module/T1 sync splitter.
1312	FAIL	The Integrated CSU (I-CSU) Module Repeater Loopback (RLB) test (#1211) failed. This test is executed during I-CSU/Sync Splitter power-up/reset (i.e., the UDS1 board is physically inserted and the CSU module or the Sync Splitter is already installed) or when the CSU module/Sync Splitter is plugged on to an already initialized DS1 board. The RLB test is also executed as part of **test ds1-loop *UUCSS* ds1/csu-loopback-tests** for the CSU module/T1 sync splitter. **1** Execute **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the RLB test continues to fail, then replace the CSU module/T1 sync splitter. **3** Run this test again.
1313	FAIL	The UDS1 circuit pack could not deactivate a CPE Loop-Back Jack loopback. **1** Execute **test ds1-loop *UUCSS* end-loopback/span-test**. **2** If the attempt to deactivate the CPE Loop-Back Jack is not successful, check the cabling and investigate the problem at the CPE Loop-Back Jack. **3** Run the test again.
1314	FAIL	The UDS1 circuit pack could not deactivate a far-end CSU loopback. **1** Execute ***test* ds1-loop *UUCSS* end-loopback/span-test**.

Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1320	FAIL	Either a CSU module/Sync Splitter hardware failure or an ICSU/Sync Splitter serial-interface audit failure was detected by the UDS1 circuit pack. **1** Replace the CSU module/Sync Splitter, and then run the test again. **2** If the test continues to fail with this error code, replace the UDS1-BD circuit pack, and run the test again. **3** If the test continues to fail with this error code, then the problem could be in the I/O cable between the backplane and the CSU module/Sync Splitter.
1321	FAIL	DTE LOS (loss of signal) was detected between the UDS1 board and the CSU module or the Sync Splitter. Either the UDS1 board, the CSU module/Sync Splitter, or the I/O cable between the backplane and the CSU module/Sync Splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. **1** Replace the CSU module/Sync Splitter, and run the test again. **2** If the test continues to fail with this error code, then replace the UDS1-BD board, and run the test again. **3** If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module/Sync Splitter.
1322	FAIL	No 5-Volt power detected from the UDS1 circuit pack to the CSU module or the Sync Splitter. Problem is probably due to an open fuse on the DS1 board or to a faulty ICSU/Sync Splitter. **Note:** Do not immediately swap a DS1 board as this may blow the fuse on the new board. **1** If the test continues to fail with this error code, then replace the CSU module/Sync Splitter, and run the test again. **2** Remove the UDS1 from the system and reinsert. **3** Run the test again once the board has finished its reset. **4** If the test continues to fail with this error code, then replace the UDS1-BD board, and run the test again. **5** If the test continues to fail with this error code, the problem could be in the I/O cable between the backplane and the CSU module/Sync Splitter.
1323	FAIL	A service-affecting CSU module/Sync Splitter audit failure was detected by the UDS1 circuit pack. Every administered port on the UDS1 circuit pack is affected, and maintenance software will place the ports into the out-of-service state. **1** Replace the CSU module or the Sync Splitter.

Table 850: Test #138 Loss of Signal Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1324	FAIL	A non-service-affecting CSU module/Sync Splitter audit failure was detected by the UDS1 circuit pack. No ports should be affected. No immediate action is required. These errors indicate that the CSU module/Sync Splitter hardware may have a problem, and that it should be replaced when practical to avoid further deterioration.
1400	FAIL	Echo Canceller function failed. This could be a hardware problem on the TN464GP/TN2464BP: **1** Issue **busyout board**. **2** Issue **reset board**. **3** Issue **test board long**. **4** Issue **release board**. **5** If Test 1420 still fails, replace the TN464GP/TN2464BP.
1401	FAIL	Echo Canceller memory failed, this could be a hardware problem on the TN464GP/TN2464BP: **1** Issue **busyout board**. **2** Issue **reset board**. **3** Issue **test board long**. **4** Issue **release board**. **5** If the test still fails, replace the TN464GP/TN2464BP.
	PASS	DS1 signal is present and the physical link is healthy. In addition, no Integrated CSU/Sync Splitter errors or echo cancellation errors are detected.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

Blue Alarm Inquiry Test (#139)

The Blue Alarm is a signal sent by the remote DS1 endpoint when it is out-of-service. The Blue Alarm Inquiry test checks the blue alarm status of the remote DS1 endpoint.

When the UDS1 Interface circuit pack detects a Blue Alarm signal from the remote DS1 endpoint, the circuit pack transmits a Yellow alarm to the remote DS1 endpoint and sends a BLUE ALARM message to the maintenance software. When the Blue alarm is confirmed, the maintenance software places every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. The inquiry test runs every 10 minutes until the Blue alarm is cleared.

The UDS1 Interface circuit pack takes one second to recognize and report a Blue alarm and 16 seconds to recognize and report the resolution of a Blue alarm. When the Blue alarm is cleared, the UDS1 Interface circuit pack stops transmitting the Yellow alarm and places the trunks or ports back into the service state before the Blue alarm occurs.

Line Loop-Back Alarm

The LLB (Line Loopback) is used by the remote DS1 endpoint to put the ICSU or DS1 board into a loop-back mode. When the ICSU or DS1 board is in the LLB mode, the arriving bit pattern is regenerated and sent back. The LLB Alarm activates when the in-band activate LLB bit pattern arrives continuously for 5 seconds on the DS1 line. The LLB deactivates when the in-band deactivate LLB bit pattern arrives continuously for 5 seconds on the DS1 line.

Because LLB is a maintenance condition rendering every DS0 channel unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Payload Loopback Alarm

The PLB (Payload Loopback) is used by the remote DS1 endpoint to put the switch DS1 into a loop-back mode. The PLB Alarm activates when a network protocol activate bit pattern arrives over the 4-kbps ESF data link on the DS1 line. The PLB deactivates when a network protocol deactivate bit pattern arrives over the 4-kbps ESF data link on the DS1 line.

Because PLB is a maintenance condition rendering every DS0 channel unavailable for signaling or bearer traffic, maintenance software treats this the same as a Blue Alarm.

Table 851: Test #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Test #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system tries to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The remote DS1 endpoint is out-of-service.
1, 1794	FAIL	The UDS1 Interface circuit pack detects a Line Loopback Alarm (LLB). If the UDS1 interface circuit pack connects to a T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the UDS1 interface circuit pack connects directly to a switch, call the system technician of the remote switch to diagnose the DS1 endpoint. If the UDS1 interface circuit pack connects directly to a line-side terminating device (for example, a PRI terminal adapter), call the vendor of the terminating device to diagnose the equipment.

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Table 851: Test #139 Blue Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1795	FAIL	The UDS1 Interface circuit pack detects a Payload Loopback Alarm (PLB). If the UDS1 Interface circuit pack connects to a leased T1 facility, call the vendor of the T1 carrier to diagnose the remote DS1 endpoint. If the UDS1 Interface circuit pack connects directly to another DS1 board, call the system technician of the remote switch to diagnose the DS1 endpoint. If the UDS1 Interface circuit pack connects directly to a line-side terminating device such as a PRI terminal adapter contact the vendor of the terminating device to diagnose the equipment.
	PASS	Remote DS1 endpoint is in-service. Neither a Blue alarm nor a Line Loopback alarm nor a Payload Loopback Alarm is detected by the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Red Alarm Inquiry Test (#140)

A UDS1 Interface circuit pack raises a Red alarm when the framing pattern of the incoming DS1 bit stream has been lost. The Red Alarm Inquiry test checks the framing status of a UDS1 Interface circuit pack. A UDS1 Interface circuit pack takes 3 seconds to recognize and report a Red alarm and 10 seconds to recognize and report the resolution of a Red alarm.

When the UDS1 Interface circuit pack detects a Red alarm, the circuit pack transmits a Yellow alarm to the remote DS1 endpoint and sends a **Red** alarm message to the maintenance software. After the Red alarm is confirmed, the maintenance software places every trunk or port of the circuit pack into the out-of-service state. The inquiry test runs every 10 minutes until the Red alarm is cleared.

When the Red alarm is cleared, the UDS1 Interface circuit pack stops transmitting the Yellow alarm to the remote DS1 endpoint. The maintenance software restores all trunks or ports of the UDS1 Interface circuit pack to the service state before the Red alarm occurs.

Loss of Multiframe Alarm

If the UDS1 Interface circuit pack is administered using DMI-BOS signaling, the UDS1 Interface circuit pack raises a LMA (Loss of Multiframe Alarm) when it cannot interpret the incoming signaling bits to synchronize to the multiframe pattern received in the 24th channel. Once the UDS1 Interface circuit pack detects an LMA, the circuit pack transmits a RMA (Remote Multiframe Alarm) to the remote DS1 endpoint. Maintenance software handles both Red and LMA alarms using the same mechanism.

Table 852: Test #140 Red Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Test #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 852: Test #140 Red Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	The UDS1 interface circuit pack detected a Red alarm. An out-of-frame condition occurred on the UDS1 interface circuit pack. The UDS1 interface circuit pack will transmit a Yellow alarm to the remote UDS1 endpoint until the Red alarm is retired. If the UDS1 connects to a T1 network facility or to another switch, do the following. **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **2** Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. **3** Check the physical connectivity of the UDS1 packs and of the cable. **4** Replace the local UDS1 interface circuit pack, and repeat the test. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following. **1** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **2** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **3** Contact the vendor of the line-side terminating device to diagnose the equipment. **4** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **5** Replace the local UDS1 interface circuit pack and repeat the test.

Table 852: Test #140 Red Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The test failed. The UDS1 interface circuit pack detected a loss of multiframe alarm (LMA). An out-of-frame condition occurred on the UDS1 interface circuit pack. The UDS1 interface circuit pack will transmit a remote multiframe alarm (RMA) to the remote UDS1 endpoint until the LMA is retired. If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **2** Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. **3** Check the physical connectivity of the UDS1 packs and of the cable. **4** Replace the local UDS1 interface circuit pack, and repeat the test. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following. **1** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **2** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **3** Contact the vendor of the line-side terminating device to diagnose the equipment. **4** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **5** Replace the local UDS1 interface circuit pack and repeat the test.

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Table 852: Test #140 Red Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	No Red alarm is detected on the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Yellow Alarm Inquiry Test (#141)

Receiving a Yellow alarm from a remote DS1 endpoint indicates that the remote DS1 endpoint has an out-of-frame condition. The Yellow Alarm Inquiry test is used to determine whether the remote DS1 endpoint is transmitting a Yellow alarm. The UDS1 Interface circuit pack takes 500 msec to recognize and report a Yellow alarm, and another 500 msec to recognize and report that the alarm's condition is cleared.

When the UDS1 Interface circuit pack detects a Yellow alarm from the remote DS1 endpoint, it sends a YELLOW-ALARM uplink message to the maintenance software. After the maintenance software receives the YELLOW-ALARM message, the Yellow Alarm Inquiry test is run to confirm the Yellow alarm. Once the alarm is confirmed, the maintenance software places every trunk or port on the circuit pack into the out-of-service state. The Inquiry test runs every 10 minutes until the Yellow alarm is cleared.

When the Yellow alarm is cleared, the maintenance software restores every trunk or port on the UDS1 Interface circuit pack back to its previous service state before the alarm was raised.

This Yellow alarm corresponds to the yellow F2 state documented in CCITT Recommendation I.431.

Remote Multiframe Alarm

An RMA (Remote Multiframe Alarm) indicates that the remote DS1 endpoint is in a Loss of Multiframe Alarm condition while the UDS1 Interface circuit pack is administered using the DMI-BOS common-channel signaling. The RMA is handled as a Yellow alarm.

Yellow F5 Fault Alarm

For 32-channel E1 operation with CRC4 on, the F5 fault state is defined as a fault in the user-network interface, specifically in the direction from the user (PBX) to the network. Refer to CCITT recommendation I.431.

Table 853: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Test #138 #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

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Table 853: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	The UDS1 interface circuit pack detected a Yellow alarm sent by the remote DS1 endpoint. An out-of-frame condition occurred at the DS1 endpoint. If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **2** Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. **3** Check the physical connectivity of the UDS1 packs and of the cable. **4** Replace the local UDS1 interface circuit pack, and repeat the test. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: **1** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **2** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **3** Contact the vendor of the line-side terminating device to diagnose the equipment. **4** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **5** Replace the local UDS1 interface circuit pack and repeat the test.

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Table 853: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1	FAIL	The UDS1 interface circuit pack detected a remote multiframe alarm (RMA) sent by the remote DS1 endpoint. An out-of-frame condition occurred at the DS1 endpoint. If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **2** Contact T1 Network Service or a technician at the far-end switch to diagnose the remote DS1 endpoint. **3** Check the physical connectivity of the UDS1 packs and of the cable. **4** Replace the local UDS1 interface circuit pack, and repeat the test. If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: **1** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **2** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **3** Contact the vendor of the line-side terminating device to diagnose the equipment. **4** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **5** Replace the local UDS1 interface circuit pack and repeat the test.

Table 853: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The UDS1 interface circuit pack is reporting a Yellow F5 fault alarm. There is a fault in the User-Network interface from the user (PBX) to the network. An out-of-frame condition occurs on the remote DS1 endpoint. If the UDS1 connects to a T1 network facility: **1** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **2** Contact T1 Network Service to diagnose the remote DS1 endpoint. **3** Check the physical connectivity of the DS1 Interface circuit packs and cable. **4** Replace the local UDS1 Interface circuit pack and repeat the test. If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: **1** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **2** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **3** Contact the vendor of the line-side terminating device to diagnose the equipment. **4** Check the physical connection of the UDS1 Interface circuit pack to the terminating device. Check premise distribution system (or intra-premise wiring) for physical connection failures. **5** Replace the local UDS1 Interface circuit pack and repeat the test.

Table 853: Test #141 Yellow Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	Neither a Yellow alarm nor a Remote Multiframe Alarm nor a F5 state alarm is being received from the remote DS1 endpoint.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue the **reset board** command. **5** Issue the **release board** command. **6** Issue the **test board long** command. This should re-establish the linkage between the internal ID and the port.

Major Alarm Inquiry Test (#142)

The Major alarm raised by a UDS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1000. The Major Alarm Inquiry test is used to determine that the received DS1 bit error rate is greater than 1/1000. The UDS1 Interface circuit pack takes 10 seconds to recognize and report a Major alarm and 10 seconds to recognize and report that a Major alarm condition is cleared.

When the UDS1 Interface circuit pack detects a Major alarm, it sends a MAJOR-ALARM message to the maintenance software. (32-channel interfaces send a YELLOW alarm to the far end). After the maintenance software receives a MAJOR-ALARM message, the Major Alarm Inquiry test is initiated to confirm the Major alarm on the UDS1 Interface circuit pack. The Inquiry test runs every 10 minutes until the Major alarm is cleared. The maintenance software places every trunk or port on the circuit pack in the out-of-service state if the Major alarm persists for more than 20 minutes.

When the Major alarm is cleared, the maintenance software restores every trunk or port on the circuit pack to its previous service state before a Major alarm occurs.

Table 854: Test #142 Major Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Test #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** The performance of the DS1 link between the UDS1 interface circuit pack and the remote DS1 endpoint is very poor. Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **2** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **3** Contact T1 Network Service or the technician at the remote switch to diagnose the equipment. **4** Check the physical connectivity of the UDS1 interface circuit packs and the cable. **5** Replace the local UDS1 interface circuit pack, and repeat the test.

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Table 854: Test #142 Major Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL *(cont'd)*	If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: **1** The performance of the DS1 link between the UDS1 interface circuit pack and the line-side terminating device is very poor. Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **2** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **3** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **4** Contact the vendor of the line-side terminating device to diagnose the equipment. **5** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **6** Replace the local UDS1 interface circuit pack and repeat the test.
	PASS	No Major alarm is detected in the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board is shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Minor Alarm Inquiry Test (#143)

The Minor alarm raised by a UDS1 Interface circuit pack indicates that the average bit error rate on the DS1 facility is greater than 1/1,000,000, but less than 1/1000. The Minor Alarm Inquiry test is used to determine that the received DS1 bit error rate is greater than 1/1,000,000 and less than 1/1000. When D4 framing mode is selected, the UDS1 Interface circuit pack takes 41 minutes to recognize and report a

Minor alarm and 41 minutes to recognize and report that a Minor alarm condition has cleared. If ESF framing mode is selected, the UDS1 Interface circuit pack takes 10 minutes to recognize and report a Minor alarm and 10 minutes to recognize and report that a Minor alarm condition has cleared.

When the UDS1 Interface circuit pack detects a Minor alarm condition, it sends a MINOR-ALARM message to the maintenance software. After the maintenance software receives a MINOR-ALARM message, the Minor Alarm Inquiry test is initiated to confirm the Minor alarm. Every trunk or port on the circuit pack is kept in the in-service state after the Minor alarm is confirmed. The Minor Alarm Inquiry test runs every 10 minutes until the Minor alarm is cleared.

Table 855: Test #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

Table 855: Test #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	FAIL	Minor alarms are often accompanied by slip and misframe alarms against the board. Trunk alarms and hardware error logs may occur on the associated trunks. If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** The performance of the DS1 link between the UDS1 interface circuit pack and the remote DS1 endpoint is poor. Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **2** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **3** Contact T1 Network Service or the technician at the remote switch to diagnose the equipment. **4** Check the physical connectivity of the UDS1 interface circuit packs and the cable. **5** Replace the local UDS1 interface circuit pack, and repeat the test.
	FAIL *(cont'd.)*	If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: **1** The performance of the DS1 link between the UDS1 interface circuit pack and the line-side terminating device is very poor. Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **2** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **3** Investigate the maintenance status of the line-side terminating device. Obtain the error seconds measurement on the terminating device (if possible). Refer to the 'Line-Side Terminating Device Operating Manual' for information. **4** Contact the vendor of the line-side terminating device to diagnose the equipment. **5** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **6** Replace the local UDS1 interface circuit pack and repeat the test.

Table 855: Test #143 Minor Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	No Minor alarm is detected in the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Slip Alarm Inquiry Test (#144)

Slips occur when transmitter and receiver are not running at precisely the same clock rate. The UDS1 Interface circuit pack can detect both positive and negative slips on the DS1 facility. The Slip Alarm Inquiry test is used to acquire the total number of slips that have occurred on a DS1 link.

When the UDS1 Interface circuit pack detects a slip condition, the circuit pack increments the on-board slip counter by one. A SLIP-COUNT message is spontaneously sent to the system software after the counter reaches a threshold (for example, 88). When the maintenance software receives the SLIP-COUNT message, the Slip Alarm Inquiry test is initiated to query the slip counters on a UDS1 Interface circuit pack and total the slip counts in the maintenance software.

If the count of slips is over the threshold, a Minor alarm is raised against the UDS1 Interface circuit pack. Every trunk or port of the UDS1 Interface circuit pack remains in the in-service state. If the UDS1 Interface circuit pack is used to supply the system synchronization source, the MINOR alarm will initiate a synchronization source switch. See "TDM-BUS (TDM Bus)" and SYNC (Port-Network Synchronization) on page 1751 for details.

Table 856: Test #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 856: Test #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1 to 88	FAIL	The test failed because the UDS1 interface circuit pack and the remote DS1 endpoint are not synchronized to the same clock rate. The UDS1 interface circuit pack detected a slip alarm. The error code equals the number of slips detected by the UDS1 interface circuit pack since the last slip alarm inquiry test. If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** Retry the command at 1-minute intervals up to 5 times. **2** If the DS1 interface circuit pack is a TN464C, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **4** Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors. **5** Contact T1 Network Service or the technician at the remote switch to diagnose the remote DS1 endpoint. **6** Check the physical connectivity of the UDS1 interface circuit packs and the cable. **7** Replace the local UDS1 interface circuit pack, and repeat the test.
1 to 88 *(cont'd)*	FAIL *(cont'd)*	If the UDS1 connects to a line-side terminating device (for example, a PRI terminal adapter), do the following: **1** Retry the command at 1-minute intervals up to 5 times. **2** Enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **4** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **5** Contact the vendor of the line-side terminating device to diagnose the equipment. **6** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. 7) Replace the local UDS1 interface circuit pack and repeat the test.

Table 856: Test #144 Slip Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	No Slip alarm is detected on the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Misframe Alarm Inquiry Test (#145)

Misframe Alarm indicates that framing bits observed on a UDS1 Interface circuit pack are in error. The Misframe Alarm Inquiry test queries the total number of misframes that have occurred on a DS1 Interface circuit pack since the last inquiry.

When the DS1 Interface circuit pack detects a misframe error, it increments its misframe counter by one. If the counter reaches a specified threshold (i.e., 17), a MISFRAME-COUNT message is automatically sent to the switch maintenance software. After the maintenance software receives the MISFRAME-COUNT message, the Misframe Alarm Inquiry test is initiated to collect the misframe counts from the UDS1 Interface circuit pack.

When the threshold of misframes is reached, if the UDS1 Interface circuit pack is supplying the system synchronization source, then a switching synchronization source message is sent to the TDM bus Clock. See "TDM-BUS (TDM Bus)" on page 1832 for details. A Minor alarm against the UDS1 Interface circuit pack is raised, but every trunk or port of the UDS1 Interface circuit pack remains in the in-service state.

Table 857: Test #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 857: Test #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
1 to 17	FAIL	The test failed because the UDS1 interface circuit pack detected errors in the received framing bits pattern. The error code equals the number of misframes detected by the UDS1 interface circuit pack since the last misframe alarm inquiry test. Major bit and minor bit error rate (error types 2561 and 2817) error logs often accompany misframe alarms. Clearing the cause of these error logs may clear the misframes which are occurring. If the UDS1 connects to a T1 network facility or to another switch, do the following: **1** Retry the command at 1-minute intervals up to 5 times. **2** If the DS1 interface circuit pack is a TN464C, enter **list measurement ds1-log *UUCSS*** to read the error seconds measurement. **3** Verify that both endpoints of the DS1 link are administered using the same signaling mode, framing mode, and line coding. **4** Check the active alarm and error logs for recent alarms and errors against the synchronization (SYNC). Follow the suggested repair procedure for these errors. **5** Contact T1 Network Service or the technician at the remote switch to diagnose the remote DS1 endpoint. **6** Check the physical connectivity of the UDS1 interface circuit packs and the cable. **7** Replace the local UDS1 interface circuit pack, and repeat the test.
1 to 17 *(cont'd)*	FAIL *(cont'd)*	If the UDS1 connects to a line-side terminating device such as a PRI terminal adapter: **1** Retry the command at 1-minute intervals up to 5 times. **2** Enter the **list measurement ds1-log *UUCSS*** command to read the error seconds measurement. **3** Verify that the switch DS1 and the line-side terminating device are administered using the same signaling mode, framing mode, and line coding. **4** Investigate the maintenance status of the line-side terminating device. Refer to the 'Line-Side Terminating Device Operating Manual' for information. **5** Contact the vendor of the line-side terminating device to diagnose the equipment. **6** Check the physical connection of the UDS1 interface circuit pack to the terminating device, and check the premise distribution system (or the intra-premise wiring) for physical connection failures. **7** Replace the local UDS1 interface circuit pack and repeat the test.

Table 857: Test #145 Misframe Alarm Inquiry Test

Error Code	Test Result	Description / Recommendation
	PASS	No Misframe alarm is detected on the UDS1 Interface circuit pack.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 UUCSS** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, then issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Translation Update Test (#146)

The Translation Update test sends the circuit-pack-level information specified by System Administration to the UDS1 Interface circuit pack. Translation includes the following data administered for a UDS1 Interface circuit pack (see output of **display ds1 *UUCSS***): DS1 Link Length between two DS1 endpoints, Synchronization Source Control, All Zero Suppression, Framing Mode, Signaling Mode, Time Slot Number of 697-Hz Tone, Time Slot Number of 700-Hz Tone, etc.

If a TN464F or later UDS1 circuit pack is combined with a 120A1 CSU module or the 401A T1 sync splitter to screen an Integrated CSU module/T1 sync splitter, this test will also send the administration for this Integrated CSU to the circuit pack to assure the board's translations are correct. The administration of the CSU module/T1 sync splitter is done using the **DS1 Circuit Pack** administration screen. Translation for the CSU module/T1 sync splitter includes the following data: Transmit LBO, Receive ALBO, Supply CPE Loop-Back Jack Power?, etc.

Table 858: Test #146 Translation Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute interval s up to 5 times.
	FAIL	Internal system software error. **1** Enter **display ds1 *UUCSS*** to verify the UDS1 Interface circuit pack translation.

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Table 858: Test #146 Translation Update Test

Error Code	Test Result	Description / Recommendation
	PASS	Translation data has been downloaded to the UDS1 Interface circuit pack successfully.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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DS1 Board Loop-back Test (#1209)

This test is **destructive**.

The DS1 BLB (Board Loopback) test causes a loop back at the DS1 board edge and tests DS1 board internal circuitry.

The test is destructive and can only be initiated by **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the BLB test.

When the BLB test is initiated, maintenance software sends an appropriate message to the UDS1 Interface circuit pack to start the test. The board sets up the BLB loopback, transmits a test pattern, and verifies that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

When the test is complete, every trunk or port on the TN464GP/TN2464BPTN UDS1 Interface circuit pack is restored to the in-service state after **release board** is entered.

Table 859: Test #1209 DS1 Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	DS1 Board Loopback test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The "Bit Rate" field on the DS1 circuit pack administration screen must be set to "1.544" for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue **disable synchronization-switch**. **2** Issue **set synchronization *UUCSS***. **3** Issue **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network-requested loop-back mode (line loopback or payload loopback). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line-loopback or payload-loop-back mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated via **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.

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Table 859: Test #1209 DS1 Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	UDS1 Interface circuit pack failed the DS1 Board Loopback test. **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the BLB test continues to fail, then replace the UDS1 circuit pack.

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Table 859: Test #1209 DS1 Board Loop-Back Test

Error Code	Test Result	Description / Recommendation
	PASS	The BLB test executed successfully. The test pattern was transmitted and received successfully up to the DS1 board edge.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board** command. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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CSU Equipment Loop-Back Test (#1210)

This test is **destructive**.

The CSU Equipment Loopback (ELB) test causes a loopback at the near-edge of the local 120A1 CSU module or the 401A T1 sync splitter and tests the connection from the DS1 board to the CSU module/T1 sync splitter (DS1 board edge interconnecting cable, and CSU module/T1 sync splitter edge). This test is only performed if the 120A1 CSU module or the 401A T1 sync splitter is present, administered, and connected to a 1.544-Mbps DS1 circuit pack behind the port carrier.

The test is destructive and can only be initiated by a system technician demanded **test ds1-loop *UUCSS* ds1/csu-loopback-tests** command.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using the system technician **busyout board** command before running the ELB test.

When the ELB test is initiated, maintenance software sends an appropriate message to the UDS1 Interface circuit pack to start the test. The board sets up the ELB loopback, transmits a test pattern, and verifies that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

When the test is complete, every trunk or port on the UDS1 Interface circuit pack is restored to the in-service state after the **release board** command is entered.

Table 860: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	CSU Equipment Loopback test cannot be executed in the current configuration. To run this test, the `Near-End CSU Type` field on the ***DS1circuit pack*** administration screen must be set to **integrated** and the `Bit Rate` field on the ***DS1 circuit pack*** administration screen must be set to **1.544** (24-channel configuration). **1** Use **change ds1 *UUCSS*** to set the `Near-End CSU Type` field on the ***DS1 circuit pack*** administration screen to **integrated**, and/or change the `Bit Rate` field to **1.544** if the board is to be used in 24-channel configuration. **2** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue the **disable synchronization-switch**. **2** Next, issue **set synchronization *UUCSS***. **3** Lastly, issue **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network-requested loop-back mode (line loopback or payload loopback). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line-loopback or payload-loop-back mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated using **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.
1951	ABORT	The CSU Equipment Loopback test could not be executed because the 120A1 CSU module or the 401A T1 sync splitter was not physically installed. Physically connect the 120A1 CSU module or the 401A T1 sync splitter to the UDS1-BD board behind the port carrier.

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Table 860: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	UDS1 Interface circuit pack failed the CSU Equipment Loopback test. **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the ELB test continues to fail, then either the UDS1-BD board, the CSU module/T1 sync splitter, or the I/O cable between the backplane and the CSU module/T1 sync splitter (or any combination thereof) has failed. Attempt to isolate the problem to one of these areas. **3** Replacing the CSU module/T1 sync splitter and running **test ds1-loop *UUCSS* ds1/csu-loopback-tests** again. **4** If the ELB test continues to fail, replace the UDS1-BD board, and run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** again. **5** If the ELB test continues to fail, the problem could be in the I/O cable between the backplane and the CSU module/T1 sync splitter.

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Table 860: Test #1210 CSU Equipment Loop-Back Test

Error Code	Test Result	Description / Recommendation
	PASS	The ELB test executed successfully. The test pattern was transmitted and received successfully over the connection from the DS1 board to the near-edge of the 120A1 CSU module or the 401A T1 sync splitter.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue the **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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CSU Repeater Loop-Back Test (#1211)

This test is **destructive**.

The CSU Repeater Loopback (RLB) test causes a loopback at the far-edge of the local 120A1 CSU module or the 401A T1 sync splitter and tests the connection from the DS1 board to and including the CSU module/T1 sync splitter circuitry. This test is only performed if the 120A1 CSU module or the 401A T1 sync splitter is present, administered, and connected to a 1.544-Mbps DS1 circuit pack behind the port carrier.

The test is destructive and can only be initiated by **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the RLB test.

When the RLB test is initiated, maintenance software sends an appropriate message to the UDS1 Interface circuit pack to start the test. The board sets up the RLB loopback, transmits a test pattern, and verifies that the pattern is received unaltered through the loopback. If the transmitted and received pattern is different, the test fails.

When the test is complete, every trunk or port on the UDS1 Interface circuit pack is restored to the in-service state after **release board** is entered.

Table 861: Test #1211 CSU Repeater Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests** at 1-minute intervals up to 5 times.
1005	ABORT	CSU Repeater Loopback test cannot be executed in the current configuration. To run this test, the `Near-End CSU Type` field on the ***DS1 Circuit Pack*** administration screen must be set to **integrated** and the `Bit Rate` field on the ***DS1 Circuit Pack*** administration screen must be set to **1.544** (24-channel configuration). **1** Use **change ds1 *UUCSS*** to set the `Near-End CSU Type` field on the ***DS1 Circuit Pack*** administration screen to **integrated**, and/or change the `Bit Rate` field to **1.544** if the board is to be used in 24-channel configuration. **2** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue **disable synchronization-switch**. **2** Next, issue **set synchronization *UUCSS***. **3** Lastly, issue **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network-requested loop-back mode (line loopback or payload loopback). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line-loopback or payload-loop-back mode. Only one long-duration loopback/span tests can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated using **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.
1951	ABORT	The CSU Repeater Loopback test could not be executed because the 120A1 CSU module or the 401A T1 sync splitter was not physically installed. Physically connect the 120A1 CSU module or the 401A T1 sync splitter to the UDS1 board behind the port carrier.

Table 861: Test #1211 CSU Repeater Loop-Back Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	UDS1 Interface circuit pack failed the CSU Repeater Loopback test. **1** Retry **test ds1-loop *UUCSS* ds1/csu-loopback-tests**. **2** If the RLB test continues to fail, and the CSU Equipment Loopback test (#1210) passed, then replace the CSU module/T1 sync splitter.

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Table 861: Test #1211 CSU Repeater Loop-Back Test

Error Code	Test Result	Description / Recommendation
	PASS	The RLB test executed successfully. The test pattern was transmitted and received successfully over the connection from the UDS1 board to the far-edge of the 120A1 CSU module or the 401A T1 sync splitter.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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CPE Loop-Back Jack Test (#1212)

This test is **destructive**.

The CPE Loop-Back Jack (CLJ-LB) test causes a loopback at the CPE Loop-Back Jack and tests the building wiring connection between the UDS1-BD DS1 board and the CPE Loop-Back Jack.

The test is highly destructive and can only be initiated by **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin [*number-of-bits bit-pattern*]**. The System technician has the choice of entering a loopback activation code on the command line or using the default code *0x47F*.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the CPE Loop-Back Jack test.

The CPE Loop-Back Jack test has the UDS1 Interface circuit pack transmit a loopback activation code to the CPE Loop-Back Jack, waits up to 10 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result to indicate that the pattern was successfully sent. If the loopback is not established within the 10 seconds, the test returns FAIL or abort.

The status of the CPE Loop-Back Jack test is available in the hardware error log via Error Type 3900. Several distinct Aux values give the user information about the status of the test.

The **list measurements ds1 summary** command shows the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error`

`Count` field). If the test pattern is being passed through the loopback cleanly, the number of bit errors should be very low. The command will also display the type of Loopback/Span test executing (`Test` field), the type of pattern generated for the Loopback/Span test (`Pattern` field), and whether the pattern (i.e., 3-in-24 Pattern) is synchronized (`Synchronized` field).

To terminate the test, enter **test ds1-loop *UUCSS* end-loopback/span-test** or **release board**. Using **release board** restores every trunk or port on the UDS1 Interface circuit pack to the in-service state.

Table 862: Test #1212 CPE Loop-Back Jack Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	CPE Loop-Back Jack test cannot be executed in the current configuration. To run this test, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The `Bit Rate` field on the ***DS1 circuit pack*** administration screen must be set to **1.544** for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue **disable synchronization-switch**. **2** Issue the **set synchronization *UUCSS***. **3** Issue the **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network-requested loop-back mode (line loopback or payload loopback). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line-loopback or payload-loop-back mode. Only one long-duration loopback/span test can be active at a given time. If a loopback/span test is already active, terminate the test with **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.

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Table 862: Test #1212 CPE Loop-Back Jack Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 862: Test #1212 CPE Loop-Back Jack Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The CLJ-LB test failed because it was not set up properly. The UDS1 interface pack could not successfully put the CPE loopback jack into loop-back mode. **1** Rerun **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin**. **2** If the test continues to fail, the problem could be with the UDS1-BD board, the CPE loopback jack equipment, or somewhere between. Run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** to determine whether the loop-back tests that are closer to the UDS1-BD board are successful. If any of these tests fail, follow the maintenance strategy that is associated with the failing test.
3	FAIL	The CPE Loop-Back Jack test was not set up properly. The framed 3-in-24 test pattern, generated by the UDS1 Interface circuit pack and looped back through the CPE Loop-Back Jack, could not be detected properly by the UDS1 circuit pack. **1** Retry **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin**. **2** If the CPE Loop-Back Jack test continues to fail, the problem could be with the UDS1-BD board, the CPE Loop-Back Jack equipment, or somewhere in between. Run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** to see if the loop-back tests closer to the UDS1-BD board are successful. If any of those loop-back tests fail, follow the maintenance strategy associated with those loopbacks.
	PASS	The CPE Loop-Back Jack test has successfully began executing. The test will continue to run until the system technician enters **test ds1-loop *UUCSS* end-loopback/span-test** or **release board *UUCSS***.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Far CSU Loop-Back Test (#1213)

This test is **destructive**.

The Far CSU Loopback (R-LLB) test causes a loopback at the far-end CSU and tests all circuitry and facilities from the local DS1 board to the far-end CSU.

The test is destructive and can only be initiated by **test ds1-loop *UUCSS* far-csu-loopback-test-begin**.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the Far CSU Loopback test.

If the far-end CSU is not a 120A1 CSU module or the 401A T1 sync splitter, and the DS1 is administered for ami-zcs line coding, density protection must be disabled on the CSU/T1SS during the test due to the large number of zero's in the 3-in-24 test pattern.

The Far CSU Loopback test has the UDS1 Interface circuit pack transmit a loopback activation code to the remote CSU, waits up to 15 seconds for return of the code to verify the loopback has been established, transmits a framed 3-in-24 test pattern, begins counting bit errors in the received test pattern, and returns a PASS result. If the loopback is not established within the 15 seconds, the test fails.

The status of the Far CSU Loopback test is available in the hardware error log via Error Type 3901. Several distinct Aux values give the user information about the status of the test.

The **list measurements ds1 summary** command shows the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is being passed through the loopback cleanly, the number of bit errors should be very low. The command will also display the type of Loopback/Span test executing (`Test` field), the type of pattern generated for the type of Loopback/Span test (`Pattern` field), and whether the pattern (i.e., 3-in-24 Pattern) is synchronized (`Synchronized` field).

To terminate the test, enter **test ds1-loop *UUCSS* end-loopback/span-test** or **release board**. Using **release board** restores every trunk or port on the UDS1 Interface circuit pack to the in-service state.

Table 863: Test #1213 Far CSU Loop-Back Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* far-csu-loopback-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	Far CSU Loopback test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The `Bit Rate` field on the ***DS1 circuit pack*** administration screen must be set to **1.544** for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.

Table 863: Test #1213 Far CSU Loop-Back Test

Error Code	Test Result	Description / Recommendation
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue **disable synchronization-switch**. **2** Next, issue **set synchronization *UUCSS***. **3** Lastly, issue **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (line loopback or payload loopback). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line-loopback or payload-loop-back mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated using **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every UDS1 Interface trunk is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

Table 863: Test #1213 Far CSU Loop-Back Test

Error Code	Test Result	Description / Recommendation
2	FAIL	The test failed because it was not set up properly. The UDS1 pack could not successfully put the far-end CSU into loop-back mode. **1** Rerun **test ds1-loop *UUCSS* far-csu-loopback-test-begin**. **2** If the test continues to fail, the problem could be with the UDS1-BD board, the CPE loopback jack equipment, or somewhere between. Run **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin** to determine whether the CPE loopback jack loop-back test is successful. If a CPE loopback jack device is not being used, issue **test ds1-loop *UUCSS* ds1/csu-loopback-tests** instead. If the closer loop-back test fails, follow the maintenance strategy associated with that test.
3	FAIL	The Far CSU Loopback test was not set up properly. The framed 3-in-24 test pattern, generated by the UDS1 Interface circuit pack and looped back through the far-end CSU, could not be detected properly by the UDS1 circuit pack. **1** Retry **test ds1-loop *UUCSS* far-csu-loopback-test-begin**. **2** If the Far CSU Loopback test continues to fail with this error code, the problem could be with the UDS1-BD board, the far-end CSU equipment, or somewhere in between. Run **test ds1-loop *UUCSS* cpe-loopback-jack-test-begin** to see if the CPE Loop-Back Jack test which is closer to the UDS1-BD board is successful. (If a CPE Loop-back Jack device is not being used, run **test ds1-loop *UUCSS* ds1/csu-loopback-tests** to see if these even closer loop-back tests succeed). If the closer loop-back test fails, follow the maintenance strategy associated with that loopback.
	PASS	The Far CSU Loopback test has successfully began executing. The test will continue to run until the system technician enters **test ds1-loop *UUCSS* end-loopback/span-test** or **release board *UUCSS***.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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One-Way Span Test (#1214)

This test is **destructive**.

The One-Way Span test allows 1-way span testing to and from remote test equipment or another Avaya communications system. This tests all circuitry and facilities from the local DS1 board to the remote test equipment or other Avaya communications system.

The test is destructive and can only be initiated by a **test ds1-loop *UUCSS* one-way-span-test-begin**.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the One-Way Span test.

The One-Way Span test has the UDS1 Interface circuit pack transmit a framed 3-in-24 test pattern and attempt to receive and verify the pattern. If the UDS1-BD board receives a framed 3-in-24 test pattern sent from another Avaya communications system or test equipment at the far end of the DS1, it begins counting bit errors within the received pattern.

NOTE:
G700: If the One-Way Span test is run between a UDS1 Interface circuit pack and an MM710 DS1 Interface Media Module on a G700 Media Gateway, the test will fail, because the MM710 does not frame-align its test pattern.

The status of the One-Way Span test is available in the hardware error log via Error Type 3902. Several distinct Aux values give the user information of the status of the test.

The **list measurements ds1 summary** command shows the length of time the test has been running (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). If the test pattern is being sent cleanly over the span from the far end, the number of bit errors should be very low. The `Test Duration` field will show `0` until the test pattern is received from the far-end. Upon receiving the test pattern, the board will begin calculating the test duration and number of bit errors. The command will also display the Loopback/Span test executing (`Test` field), the type of pattern generated for the Loopback/Span test (`Pattern` field), and whether the pattern (i.e., 3-in-24 Pattern) is synchronized (`Synchronized` field).

To terminate the test, enter **test ds1-loop *UUCSS* end-loopback/span-test** or the **release board** Using **release board** restores every trunk or port on the UDS1 Interface circuit pack to the in-service state.

Table 864: Test #1214 One-Way Span Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* one-way-span-test-begin** at 1-minute intervals up to 5 times.
1005	ABORT	One-Way Span test cannot be executed in the current configuration. To run this, the TN464F or later suffix UDS1 must be administered for 24-channel operation. The `Bit Rate` field on the ***DS1 circuit pack*** administration screen must be set to **1.544** for 24-channel operation.

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Table 864: Test #1214 One-Way Span Test

Error Code	Test Result	Description / Recommendation
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
1039	ABORT	The UDS1 Interface circuit pack is providing timing for the system. Executing this test could cause major system disruption. If the UDS1 Interface circuit pack needs to be tested, set the synchronization reference to another DS1 Interface circuit pack or to the IPSI or Tone-Clock circuit pack via the following command sequence: **1** Issue **disable synchronization-switch**. **2** Next, issue **set synchronization *UUCSS***. **3** Lastly, issue **enable synchronization-switch**.
1950	ABORT	Another loopback/span test is already executing on the DS1 board or the board is in a network requested loop-back mode (line loopback or payload loopback). The hardware error log will indicate whether a Customer Loop-Back Jack test, Far CSU Loopback test, or the One-Way Span test is executing or if the board is in line-loopback or payload-loop-back mode. Only one long-duration loopback/span test can be active at a given time. Thus, if a loopback/span test is already active, that test must be terminated using **test ds1-loop *UUCSS* end-loopback/span-test** in order to execute this test.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every trunk for the UDS1 interface circuit pack is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.

Table 864: Test #1214 One-Way Span Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The One-Way Span test has successfully began transmitting a framed 3-in-24 test pattern. The runs until the system technician enters **test ds1-loop *UUCSS* end-loopback/span-test** or **release board *UUCSS***.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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Inject Single Bit Error Test (#1215)

This test is **destructive**.

The Inject Single Bit Error test causes a single bit error to be sent within an active framed 3-in-24 test pattern.

The test is highly destructive and can only be initiated by a **test ds1-loop *UUCSS* inject-single-bit-error**. An attempt to use this command is rejected if none of the three long-duration DS1 loopback/span tests (CPE Loop-Back Jack test, Far CSU Loopback test, One-Way Span test) are active on a UDS1-BD circuit pack.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running the Inject Single Bit Error test.

The **list measurements ds1 summary** command shows the number of bit errors detected (`Loopback/Span Test Bit-Error Count` field). Injecting this single bit error should increment the bit error count of the loopback/span test by one.

Table 865: Test #1215 Inject Single Bit Error Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* inject-single-bit-error** at 1-minute intervals up to 5 times.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and the ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every trunk for the UDS1 interface circuit pack is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	A single bit error has been successfully injected into an active framed 3-in-24 test pattern.

1 of 2

Table 865: Test #1215 Inject Single Bit Error Test

Error Code	Test Result	Description / Recommendation
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** command to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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End Loopback/Span Test (#1216)

This test is **destructive**.

The End Loopback/Span test terminates an active loopback or span test on a UDS1 circuit pack. Bit error counting against the received test pattern stream is terminated and sending of the framed 3-in-24 test pattern is halted. If either the CPE Loop-Back Jack or the far-end CSU is looped, the appropriate loopback deactivate code is sent. If the loopback cannot be deactivated, then the test returns FAIL, and a MINOR alarm is noted in the alarm log until the loopback is cleared.

The test is highly destructive and can only be initiated by a **test ds1-loop *UUCSS* end-loopback/span-test**. Since only one of these three different long-duration loopback/span tests can be active at a time, the UDS1-BD circuit pack knows which loopback/span test to terminate.

Every trunk or port on the UDS1 Interface circuit pack must be busied out using **busyout board** before running this End Loopback/Span test.

The **list measurements ds1 summary** command will display the length of time the test ran (`Test Duration` field) and number of bit errors detected (`Loopback/Span Test Bit-Error Count` field).

To restore the trunks or ports on the UDS1 Interface circuit pack to the in-service state, execute **release board**.

Table 866: Test #1216 End Loopback/Span Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry **test ds1-loop *UUCSS* end-loopback/span-test** at 1-minute intervals up to 5 times.
1005	ABORT	End Loopback/Span test cannot be executed in the current configuration. To run this test, the TN464F or later suffix DS1 board must be administered for 24-channel operation. The `Bit Rate` field on the ***DS1 circuit pack*** administration screen must be set to **1.544** for 24-channel operation.
1015	ABORT	Ports on the UDS1 Interface circuit pack have not been busied out to out-of-service. **1** Enter **busyout board *UUCSS*** to put every trunk or port of the UDS1 Interface circuit pack into the out-of-service state. **2** Retry the command.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every trunk for the UDS1 interface circuit pack is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
1313	FAIL	The UDS1 circuit pack could not deactivate the loopback through the Customer Loop-Back Jack. **1** Retry **test ds1-loop *UUCSS* end-loopback/span-test** at 1-minute intervals up to 5 times.

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Table 866: Test #1216 End Loopback/Span Test

Error Code	Test Result	Description / Recommendation
1314	FAIL	The UDS1 circuit pack could not deactivate the loopback through the far-end CSU. **1** Make sure that the far-end DS1 is installed if the far-end CSU is a 120A1 CSU module/T1 sync splitter. **2** Retry **test ds1-loop *UUCSS* end-loopback | span-test** at 1-minute intervals up to 5 times.
	PASS	The active long-duration loopback or span test on the UDS1-BD circuit pack was successfully terminated.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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ICSU Status LEDs Test (#1227)

The UDS1 circuit pack has four status LEDs on the faceplate in addition to the three standard faceplate LEDs. These four status LEDs are associated with the 120A1 Channel Service Unit (CSU) Module that can be connected to the UDS1-BD board through the I/O connector panel behind the port carrier. The UDS1-BD circuit pack, combined with the 120A1 CSU module or the 401A T1 sync splitter, forms an Integrated CSU (I-CSU).

This test is a visual test. It lights the four status LEDs red for 5 seconds, then lights them green for 5 seconds, then lights them yellow for 5 seconds, then turns the LEDs off and returns control of the status LEDs to the circuit pack.

This test is only be executed on TN464F or later suffix UDS1 circuit packs administered for 24-channel operation (1.544 bit rate).

If the 120A1 CSU module or the 401A T1 sync splitter is not physically installed, the status LEDs are always off and this test aborts.

Table 867: Test #1227 ICSU Status LEDs Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	The ICSU Status LEDs test cannot be executed for the current configuration. The test applies only to TN464F or later UDS1 circuit packs administered for 24-channel (1.544-Mbps) operation. **1** If the circuit pack is a TN464F or later suffix UDS1 circuit pack, then retry the command.
1951	ABORT	The ICSU Status LEDs test cannot be executed because a 120A1 or later suffix CSU module or a 401A or later suffix T1 sync splitter is not physically installed. If using a 120A1 CSU module or the 401A T1 sync splitter, physically connect it to the UDS1-BD board behind the port carrier. Otherwise, ignore this abort.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2500	ABORT	Internal system error. **1** Retry the command.
	PASS	The ICSU Status LEDs test executed successfully. A PASS result, however, does not necessarily mean that the status LEDs behaved properly. It only means that the software successfully attempted to light the status LEDs. This is a visual test. The service technician must visually exam the behavior of the LEDs while the test is running. The LEDs are functioning properly if the four status LEDs are lit red for 5 seconds, then lit green for 5 seconds, then lit yellow for 5 seconds. If the LEDs behave differently, the board should be replaced at the customer's convenience.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, then issue **busyout board**. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

Echo Canceller Test (#1420)

This test is **destructive**.

> **NOTE:**
> This test is executed only for TN464GP/TN2464BP circuit packs that have been administered on the DS1 circuit pack screen to provide echo cancellation. The TN464GP/TN2464BP must be busied out before this demand test is run.

This test is for the TN464GP and TN2464BP circuit packs. The test originates from a manually initiated **test board long** demand test of a TN464GP/TN2464BP circuit pack. The test instructs firmware to test the echo cancellation circuity. The TN464GP/TN2464BP firmware tests echo cancellation on a subset of channels. If any channel fails twice or if any two channels fail once, the test fails, and echo cancellation is bypassed on every channel of the board. Otherwise, the test passes, and echo cancellation is configured to the administered parameters.

Table 868: Test #1420 Echo Canceller Test

Error Code	Test Result	Description / Recommendation
1015	ABORT	The board is not busied out. This test will abort if the UDS1 circuit pack under test is in service.
2000	ABORT	Response to the test was not received within the allowable time period. This may be due to hyperactivity. Error Type 1538 in the error log indicates hyperactivity. The hyperactive circuit pack is out of service, and one or more of the following symptoms may be exhibited. **1** The UDS1-BD tests (such as Tests #138 and #139) are aborting with error code 2000. **2** The tests run on the ports of this circuit pack are returning a no-board result. **3** A **busyout** or a **release** has no effect on the test results. **4** A **list config** shows that the circuit pack and its ports are properly installed. When hyperactivity occurs, the circuit pack is isolated from the system, and all of its trunks are placed into the out-of-service state. The system will try to restore the circuit pack within 15 minutes. When no faults are detected for 15 minutes, the UDS1 interface circuit pack is restored to normal operation. Every trunk for the UDS1 interface circuit pack is then returned to the in-service state. Hyperactivity is often caused by the associated facility. In such a case, faults (such as slips, misframes, or blue alarms) would be entered in the error log. In addition, many hardware errors would be logged against the associated trunk circuits. If the facility is OK and the error occurs again after 15 minutes, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 868: Test #1420 Echo Canceller Test

Error Code	Test Result	Description / Recommendation
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times.
1400, 1401	FAIL	The Echo Cancellation test has failed: • Error 1400 - Echo canceller function failed. The Echo Canceller Function test, which is executed by firmware, failed. • Error 1401 - Echo canceller memory failed. The Echo Canceller Memory test, which is executed by firmware, failed. Echo Cancellation is no longer being supplied by the board. Clear the alarm using the following commands: **busyout board *UUCSS***, **test board *UUCSS* long**, **release board *UUCSS***. If the test still fails, replace the circuit pack. When this test fails, echo cancellation will be bypassed on every channel of the board. The circuit pack can still be used for a T1/E1 line interface without echo cancellation. This capability provides limited service for the customer until the circuit pack can be changed out.
	PASS	The Echo Cancellation feature is functioning properly.
0	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. **1** Verify that the board's translations are correct. Execute **add ds1 *UUCSS*** to administer the UDS1 interface if it is not already administered. **2** If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If so, the board was shut down. Reseating the board will re-initialize it. **3** If the board was found to be correctly inserted in step 1, then issue the **busyout board** command. **4** Issue **reset board**. **5** Issue **release board**. **6** Issue **test board long**. This should re-establish the linkage between the internal ID and the port.

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VAL-BD (Voice Announcements over LAN Circuit Pack)

S8700 / S8500 / S8100 / G700

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
VAL-BD	MINOR	**test board *location* long**	Voice Announcements over the LAN Circuit Pack
VAL-BD	WARNING	**test board *location* short**	Voice Announcements over the LAN Circuit Pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

Voice Announcements over the LAN Circuit Pack

The Voice Announcements over the LAN (VAL) board (TN2501AP) provides per-pack announcement storage time of up to one hour, up to 31 playback ports, and allows for announcement file portability over a LAN. The VAL circuit pack also allows for LAN backup and restore of announcement files and the use of user-provided (.WAV) files. The circuit pack also provides the ability to download new versions of the firmware to itself.

NOTE:
G700: The MG-ANN MO can reside in virtual slot 9 of a G700 Media Gateway. Refer to MG-ANN (Voice Announcements) on page 1248 for information about this MO.

VAL Congestion Controls

The switch activates congestion controls on VAL when it detects buffers exceeding the threshold. The switch releases the congestion controls when the VAL reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval,	Raises MINOR alarm.
Exhausts buffers,	Raises MINOR alarm.
Ceases for 12 minutes,	Retires MINOR alarm.

Configurations

The following figure shows the configuration options for the TN2501AP (VAL) circuit pack within a system.

Figure 154: VAL configuration options

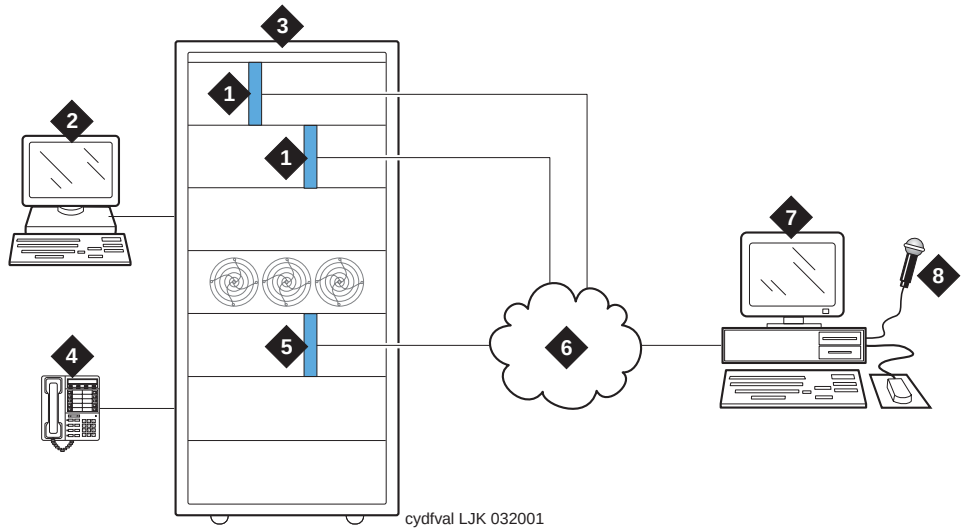


Figure Notes

1 TN2501AP VAL announcement circuit pack

2 System access terminal (SAT)

3 Switch

4 Phone for recording announcements

5 TN799C (C-LAN) is required when using IP SAT or VAL Manager.

6 Your LAN (See LAN cable)

7 Computer or remote recording studio for:

- recording and storing announcements
- FTP client application
- VAL Manager application (PC only)

8 Microphone

Hardware specifications

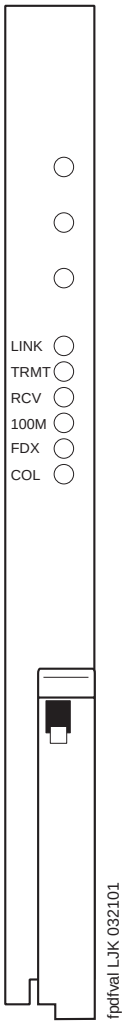
The following table contains a list of the required VAL hardware.

Part	Number	Comcode
TN2501AP	1	108772583
Backplane Adapter (Label reads IP Media Processor)	1	848525887

Faceplate LEDs

The following figure shows the 9 LEDs on the TN2051AP faceplate. Descriptions of each LED are in Table 869.

Figure 155: TN2501AP faceplate LEDs



The following table lists the TN2501AP faceplate LEDs, the type of behavior (on, off, flashing, or intermittent), and a description of the condition.

Table 869: TN2501AP LEDs

LED	Behavior	Description
Red	On solid	Circuit pack failure or a major or minor on-board alarm
Green	On solid	Firmware is self-downloading to the circuit pack or testing in progress.
Amber	On solid	Firmware is self-downloading to the circuit pack. **CAUTION:** You can lose the resident firmware image file if you reset the circuit pack during firmware download. If this happens, FTP a new firmware image file to the VAL circuit pack and perform the Firmware download procedure again.
Amber	Fast flash (100 ms on/ 100 ms off)	Occurs during circuit pack insertion or circuit pack reset which the announcement files are being copied from FLASH to RAM. If you reset the circuit pack during this time, your announcement files remain intact.
Amber	Slow flash (200 ms on/ 200 ms off)	Flashes during autosave while copying announcement files from RAM to FLASH. **CAUTION:** You can lose the announcements on the circuit pack if you reset it during an autosave.
LINK	On/off	Active Ethernet link
TRMT	Intermittent	Transmit
RCV	Intermittent	Receive
100M	On/off	Off = 10-Mbps Ethernet connection
		On = 100-Mbps Ethernet connection
FDX	On/off	Off = half-duplex connection
		On = full-duplex connection
COL	On/off	Off = no collisions detected
		On = collisions detected

Other hardware

To establish LAN connections the TN2501AP circuit pack requires a

- Backplane Adapter that attaches to the Amphenol connector behind the cabinet, corresponding to the TN2501AP integrated announcement circuit pack slot.
- LAN cable that attaches to the Backplane Adapter.

Backplane Adapter

The following figure shows the Backplane Adapter (label reads IP Media Processor).

Figure 156: Backplane Adapter (Comcode 848525887)

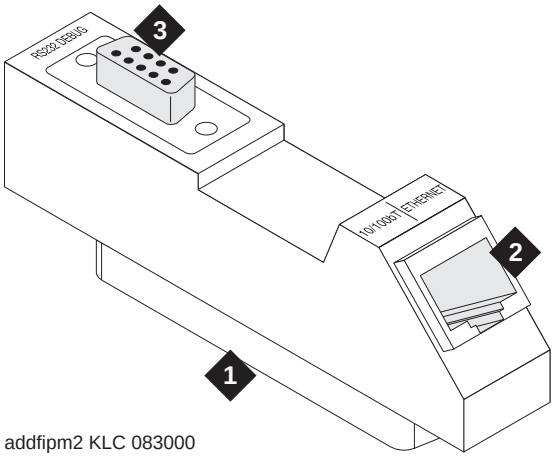


Figure Notes

1 Amphenol connector attaches to the back of the switch cabinet, corresponding to the TN2501AP circuit pack's slot.

2 RJ-45 LAN cable connection

- 10 Mbps uses Category 3 cable.
- 100 Mbps uses Category 5 cable.

3 This connector is not used for VAL.

LAN cable

The TN2501AP circuit pack does not include cables to connect the circuit pack to your LAN. The following table lists the cable category and connection port.

Ethernet connection speed	Cable	Connection description
10 Mbps	Category 3	Connects through the RJ45 jack (note #2 in Figure 156),
100 Mbps	Category 5	Connects through the RJ45 jack (note #2 in Figure 156),

Maintenance Commands

The following table lists several VAL-related maintenance commands and how to use the command for troubleshooting.

Table 870: VAL maintenance commands

Command	Use this command to
test board	Tun both circuit pack- and port-level tests.
test port	Test any of the ports on the VAL circuit pack.
test mo	Test either of the 2 MOs on the VAL circuit pack.
busyout board	Curtail activity on the circuit pack before resetting it (reset board).
release board	Resume activity on the circuit pack after busying out the VAL circuit pack or ports on it (busyout board or busyout port).
busyout port	Isolate a specific port usually during troubleshooting.
release port	Resume activity after busying out a port on the VAL circuit pack (busyout port).
reset board	Re-initialize the circuit pack in the system and upload announcement file information.
reset val	Reset the circuit pack if it is in the insane state and to override querying the board to determine whether an announcement autosave is in process.
status data-module	Obtain general information about the data-module connection to port 33 on the VAL circuit pack
status firmware download	Obtain information about a demand or scheduled firmware download.
list sys-link	Generate a list of administered links and the general status of each.
status sys-link	Generate a detailed status report for a specific administered system link.
status link	Generate a status report about a specific administered Ethernet link. (For VAL this means the administered Ethernet link.)
status val-ip	Generate an IP-related, MIB data status report.
netstat ip-route	Generate a report showing the status of the VAL IP routes on the VAL circuit pack.
list directory	See the file contents of a VAL circuit pack by location.
remove file	Delete an announcement or firmware image file on a VAL circuit pack.
enable filesystem	Begin an FTP session into a specific TN2501AP circuit pack.
disable filesystem	End an FTP session into a specific TN2501AP circuit pack.
set ethernet-options	Manually or automatically set the Ethernet connection’s parameters.
get ethernet options	Generate a report about a specific Ethernet connection.
set boot-image	Direct the system to use 1 of 2 possible firmware image files on the TN2501AP circuit pack.
get boot-image	View the two firmware image parameters on the VAL circuit pack.

Error Log Entries and Test to Clear Values

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	0	Sanity	MIN	ON	
18 (b)	0		WRN	OFF	**release board** *UUCSS*
217 (c)	0	None	WRN	ON	
257	65535	Control Channel Loop test (#52)	MIN	ON	**test board** *UUCSS l r 20*
257 (d)					
513 (e)	4352–4357		MIN	ON	
769 (f)	4358				
1281, 1290–1295 (g)	Any		MIN	ON	**reset board** *UUCSS*
1537, 1796 (h)	Any		MIN	ON	
1794 (i)			MIN	ON	
1798 (j)					
2049 (k)		Packet Interface test (#598)	MIN	ON	**test board** *UUCSS* **l r 3**
2305, 2306 (l)					
2561–2668 (m)	Any				
2817, 2819 (n)		Congestion Query test (#600)	MIN	ON	**test board** *UUCSS* **s r 3**
3073 (o)		Link Status test (#601)	MIN	ON	**test board** *UUCSS* **s**
3330 (p)			MIN	ON	**reset board** *UUCSS*
3586 (q)					
3999 (q)	Any	None			
3840 (r)	4096–4102				
3841, 3843 (s)					
3842 (t)		Receive FIFO Overflow Error Counter test (#596)			
3844 (u)	Any				
3845 (v)	Any				
3846 (w)	Any				
3848 (x)	Any				
3851 (y)	Any				
3852 (z)	Any				
3853 (aa	Any				

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
3854 (ab)	Any				
3855 (ac)	Any				
3856 (ad)	Any				

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Notes:

a **Error Type 1** — Circuit pack stopped functioning or is not physically present.

1 Verify that the circuit pack is present.

2 If circuit pack is present, reset the circuit pack (**reset board *UUCSS***).

3 If the error persists, replace the circuit pack.

b **Error Type 18** — The VAL circuit pack is busied out.

c **Error Type 217** — Applies to 10 circuit packs:

1 Remove the circuit pack(s) against which the error is logged.

d **Error Type 257** — Transient communication problem between switch and circuit pack; does not affect service and can be ignored.

1 Ignore this error, unless the Control Channel Loop test (#52) fails.

2 If Test #52 fails, replace the circuit pack.

Repetitive failures of the Control Channel Loop test indicate circuit pack hardware failure.

e **Error Type 513** — Circuit pack detected and reported hardware failure.

1 Reset the circuit pack (**reset board *UUCSS***).

Aux Data:

4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4356	Angel Message Corruption error
4357	Instruction set error

f **Error Type 769** — Logic error. By itself this error can be ignored, but it can result in other error types being reported.

g **Error Type 1281, 1290–1295** — Critical hardware or firmware error.

If the switch detects:	Then the switch:
1 error,	Resets circuit pack.
3 errors in 15 minutes,	Raises MINOR alarm.

Error Type descriptions are as follows:

1290	Global HDLC error
1291	Main RAM/ROM error
1292	CPU error
1293	Insane on-board processor
1294	On-board translation RAM error
1295	(Aux 3) RSCL link down (Aux 0) RSCL keep alive failure

1. Attempt to clear the alarm (**reset board *UUCSS***).
2. If alarm persists, replace circuit pack.

h **Error Type 1537, 1796** — A hyperactive VAL circuit pack that has exceeded the error threshold has been removed from service.

1. Attempt to clear the alarm (**reset board *UUCSS***).
2. If the error recurs within 15 minutes, replace the circuit pack.

i **Error Type 1794** — Packet bus transmit buffers have overflowed.

1. Attempt to clear the alarm (**reset board *UUCSS***).
2. If the error recurs within 15 minutes, replace the circuit pack.

j **Error Type 1798** — Unable to write translation RAM.

1. Attempt to clear alarm (**reset board *UUCSS***).
2. If alarm recurs within 15 minutes, replace the circuit pack.

k **Error Type 2049** — Packet Interface test (#598) failed.

1. Attempt to clear the alarm (**test board *UUCSS* l r 3**).
2. If alarm does not clear, reset the circuit pack (**reset board *UUCSS***).
3. If circuit pack resets, execute Packet Interface test (#598) several times.
4. If Packet Interface test (#598) continues to fail, replace the circuit pack.

l **Error Type 2305-2306** — Error in received frame from packet bus.

Error Type:	Description
2305	Received invalid LAPD frame.
2306	Detected parity error on received frame.

Most likely cause — packet bus problem.
Other cause — circuit pack fault.

Invalid LAPD frame errors occur when the frame:

- contains a bad Cyclic Redundancy Check (CRC)
- is greater than the maximum length
- violates the link-level protocol

1. Retry the (**test board *UUCSS***) and see if the condition clears.

2 If condition persists, execute PPE/LANBIC Receive Parity Error Counter test (#597) and determine whether the condition clears.

3 If condition persists, execute Packet Interface test (#598) to verify circuit pack integrity.

4 If Packet Interface test (#598) fails, consult repair procedure for the packet bus.

m **Error Type 2561–2668** — System software received an indication that the socket was closed due to an error. Errors are reported as log only. Errors logged here are for the sockets that had *no* processor channels associated with them, for example, sockets to read SNMP data. The counter base is offset by the application type of the application associated with this socket that is down. The Aux Data field of the log entry contains this application's number, for example, a SNMP application would have its application number in the Aux Data field.

NOTE:
2561–2668 is a range of reserved numbers for future applications. 2570 currently represents an SNMP socket failure.

n **Error Type 2817–2819** — Congestion Query test (#600) failed.

The Error Types correspond to the descriptions:

2817	Every buffer exhausted.
2819	Utilized buffers exceed threshold.

If:	Then:
Active buffers exceed threshold,	VAL enters congested state.

1 See Congestion Query Test (#600) on page 2053 for Abort and Fail 3601s.

o **Error Type 3073** — Remote Socket Control Link (RSCL) or Link Status test (#601) failed. This failure can be due to:

- This circuit pack
- The packet bus
- The packet interface circuit pack.

If:	Then:
RSCL disconnects at link level	Link fails
Link cannot be reconnected quickly	Switch raises MINOR alarm

p **Error Type 3330** — Critical failure in Packet bus interface.

Below, Error Types correspond to descriptions.

If the switch detects:	Then it:
1 error,	Resets circuit pack.
2 errors in 15 minutes,	Raises MINOR alarm.

1 Attempt to clear the alarm (**reset board *UUCSS***).

2 If alarm persists, replace circuit pack.

q **Error Type 3586 and 3999** — Switch removed hyperactive circuit pack that reported threshold number of errors. One or more of the following symptoms can be present:

- Circuit pack port tests return NO BOARD.
- List configuration command shows circuit pack and ports are installed properly.

If Error Type 3999:	And traffic volume is:	Then:
Does not accompany Error Type 3586	Heavy	Circuit pack is in service, but sent at least half hyperactive threshold. With heavy traffic, this is normal.
Does not accompany Error Type 3586	Light	Circuit pack is in service, but sent at least half hyperactive threshold. With light traffic, this error indicates a problem with the circuit pack, its links, or the equipment attached to the links.
Accompanies Error Type 3586,	Either Light or Heavy	Switch removed hyperactive circuit pack.

1. Issue **busyout board *UUCSS*** and **release board *UUCSS*** to reset the circuit pack.
2. Allow 30 minutes for condition to clear itself.
3. To re-establish circuit pack into service manually, issue **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***.
4. If error recurs within 15 minutes, replace the circuit pack.
5. If the same error occurs on a different circuit pack, follow normal escalation procedures.

r **Error Type 3840** — Circuit pack received bad control channel message from switch.

Aux Data:

4096	Bad major heading
4097	Bad port number
4098	Bad data
4099	Bad sub-qualifier
4100	State inconsistency
4101	Bad logical link
4102	Bad application identifier

s **Error Type 3841, 3843** — Errors do not affect service.

Below, Error Types correspond to descriptions.

3841	Internal firmware error.
3843	Bad translation RAM. Call uses another translation location.

These errors do not affect service, however, they can cause reports of other errors that do affect service.

If Error Type 3843 begins to affect service, it escalates to Error Type 1294 (See Note g).

t **Error Type 3842** — Packet interface receive buffers overflowed.

If this error occurs frequently, the overflow can be congesting the circuit pack.

See Receive FIFO Overflow Error Counter Test (#596) on page 2050.

u **Error Type 3844** — LAPD frame contains LAPD Protocol Error.

By themselves, these errors do not affect service.

v **Error Type 3845** — Angel interprocessor error.

By themselves, these errors do not affect service.

w **Error Type 3846** — Main interprocessor error.

By themselves, these errors do not affect service.

x **Error Type 3848** — Main internal channel error.

By themselves, these errors do not affect service.

y **Error Type 3851** — Unable to write LAN translation RAM error.

By themselves, these errors do not affect service.

z **Error Type 3852** — LAN external RAM error.

By themselves, these errors do not affect service.

aa **Error Type 3853** — Interprocessor LAPD frame error.

By themselves, these errors do not affect service.

ab **Error Type 3854** — Interprocessor LAPD protocol error.

By themselves, these errors do not affect service.

ac **Error Type 3855** — Memory allocation error.

By themselves, these errors do not affect service.

ad **Error Type 3856** — High CPU occupancy error.

By themselves, these errors do not affect service.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order listed in the table below.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Control Channel Loop-around test (#52)	X	X	ND
Circuit Pack Restart test (#594)			D
Invalid LAPD Frame Error Counter test (#597)		X	ND
PPE/LANBIC Receive Parity Error Counter test (#595)		X	ND
Receive FIFO Overflow Error Counter test (#596)		X	ND

1 of 2

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
Packet Interface test (#598)	X	X	ND
Congestion Query test (#600)	X	X	ND
Link Status test (#601)	X	X	ND

2 of 2

1 D = Destructive; ND = Nondestructive

Control Channel Loop-Around Test (#52)

This nondestructive test fails if the circuit pack does not return to a sane state after being reset. This test queries the circuit pack for its code and vintage, and verifies its records.

Table 871: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
None, 2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
	FAIL	The circuit pack failed to return the code or vintage. **1** Retry command at 1-minute intervals up to 5 times. **2** Reset the board (**reset board *UUCSS***). **3** If reset aborts with error code 1115, use **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. **4** If test continues to fail, replace the circuit pack. **5** Escalate the problem if failures continue.
	PASS	Test successful.

Circuit Pack Restart Test (#594)

This test is **destructive**.

Execute this test (not part of either short or long demand test sequence) to reset the circuit pack only if there are PPCPU errors. This test fails if the circuit pack does not return to a sane state after being reset. The circuit pack resets through the SAKI Sanity test (#53).

Table 872: Test #594 Circuit Pack Restart Test

Error Code	Test Result	Description / Recommendation
None	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1015	ABORT	Port is not out-of-service. **1** Busyout the circuit pack (**busyout board *UUCSS***). **2** Retry the command at 1-minute intervals up to 5 times. **3** If the problem persists, escalate the problem.
1966	ABORT	The board is in the process of running the autosave command to save announcements. **1** Retry the command again later.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1, 2	FAIL	The circuit pack failed to reset. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, pull out and reseat the circuit pack. **3** If the problem persists, replace the circuit pack.
	PASS	The circuit pack initialized correctly.

PPE/LANBIC Receive Parity Error Counter Test (#595)

This test is nondestructive. When the VAL circuit pack detects a parity error with a received frame, it increments the PPE/LANBIC Receive Parity error counter. This test reads and clears the counter, and can verify repair of the problem.

Errors can indicate a problem with:

- This circuit pack
- A packet bus
- Another circuit pack on the bus

Table 873: Test #595 PPE/LANBIC Receive Parity Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2100	ABORT	Could not allocate the necessary system resources to run test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1–10	FAIL	Circuit pack detects parity errors. The Error Code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute the Packet Interface test (#598) (**test board *UUCSS***). **3** If Packet Interface test (#598) fails, see repair procedures for Test #598.
	PASS	Circuit pack detects no errors.

Receive FIFO Overflow Error Counter Test (#596)

This test is nondestructive. When the VAL circuit pack detects packet bus buffer overflow, it increments the error on the FIFO Overflow error counter. This test reads and clears the counter.

If errors are:	Then they can be due to:
Occasional	Statistical buffer sizing

Table 874: Test #596 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.

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Table 874: Test #596 Receive FIFO Overflow Error Counter Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1–10	FAIL	Circuit pack detects overflow errors. The error code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute the Packet Interface test (#598) (**test board *UUCSS***). **3** If Packet Interface test (#598) fails, see repair procedures for Test #598.
	PASS	Circuit pack detects no errors.

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Invalid LAPD Frame Error Counter Test (#597)

This test is nondestructive.

The VAL circuit pack detects invalid frames when it receives

- a frame with a CRC error
- an unrecognizable frame
- a recognizable frame in an unexpected state

When the VAL circuit pack detects an invalid LAPD frame, it increments the Invalid LAPD Frame error counter. This test reads and clears the counter, and verifies the repair of the problem.

Errors can indicate a:

- circuit pack problem
- packet bus problem
- problem with another circuit pack on the bus

Table 875: Test #597 Invalid LAPD Frame Error Counter Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.

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Table 875: Test #597 Invalid LAPD Frame Error Counter Test

Error Code	Test Result	Description / Recommendation
2100	ABORT	Could not allocate the necessary system resources to run this test.
2500	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1–10	FAIL	The circuit pack detects LAPD frame errors. The error code indicates the value of the on-board error counter. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute the Packet Interface test (#598) (**test board *UUCSS* long**). **3** If Packet Interface test (#598) fails, see repair procedures for Test #598.
	PASS	Circuit pack detects no errors.

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Packet Interface Test (#598)

This nondestructive test checks the packet bus interface circuitry on the VAL circuit pack. Test failure indicates faulty circuit pack.

Table 876: Test #598 Packet Interface Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2012	ABORT	Could not allocate the necessary system resources to run test.
2100	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
	FAIL	Circuit pack has detected a failure of the Packet Interface test (#598). **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the test continues to fail, replace the circuit pack.
	PASS	The Packet Interface test (#598) passed.

Congestion Query Test (#600)

This nondestructive test queries the number of used buffers to determine whether the VAL circuit pack is congested.

If:	Then:
Used buffers are, or are nearly, exhausted	The test fails.
The test fails	The switch alarms, and announcements can fail.

Normal call handling resumes when the VAL circuit pack has recovered from congestion.

Table 877: Test #600 Congestion Query Test

Error Code	Test Result	Description / Recommendation
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If the problem persists, replace the circuit pack.
2012	ABORT	Could not allocate the necessary system resources to run test.
2100	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
1	FAIL	The buffer level is nearly exhausted.
2	FAIL	The VAL is congested, and no buffers are available. **1** Retry command at 1-minute intervals up to 5 times. **2** If command continues to fail, examine the VAL port measurements to determine which ports are heavily utilized and the processor occupancy of the circuit pack. *A Low processor occupancy* when VAL is congested indicates circuit pack failure. **1** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **2** If congestion recurs, replace the circuit pack. *High processor occupancy* indicates the VAL is congested due to traffic load. • To relieve congestion in the short term, selectively busyout ports (**busyout port *UUCSSpp***) on the VAL circuit pack. • To achieve a more permanent resolution, it could be necessary reassign announcements to other integrated announcement circuit packs. Consider replacing affected VAL ports with new ports.

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Table 877: Test #600 Congestion Query Test

Error Code	Test Result	Description / Recommendation
3	FAIL	The VAL circuit pack is not operating normally and is congested.
	PASS	Hardware setting and attached cable type match VAL circuit pack administration. The circuit pack detects no errors.

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Link Status Test (#601)

This nondestructive test determines the state of the call-control signaling link for VALs. If the signaling link is physically connected, the test sends a test frame over the link and checks for a response. The test passes only if both the signaling link is connected and the test frame is successfully transmitted.

A failure can indicate a problem with:

- this circuit pack
- the packet bus
- the Packet Interface circuit pack

Table 878: Test #601 Link Status Test

Error Code	Test Result	Description / Recommendation
1125	ABORT	RSCL link or VAL board not in service. **1** Release the board. **2** Repeat the test. **3** Escalate if the problem persists.
2012	ABORT	Could not allocate the necessary system resources to run this test.
2100	ABORT	Internal system error. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, escalate the problem.
2	FAIL	The RSCL control link disconnected. **1** Retry command at 1-minute intervals up to 5 times. **2** If the test continues to fail, execute the Packet Interface test (#598) (**test board *UUCSS***) to see if the problem is in the circuit pack. • If the Packet Interface test (#598) fails, see Packet Interface Test (#598) repair procedures. • If the Packet Interface test (#598) passes, see Packet Interface Test (#598) and Packet bus repair procedures.

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Table 878: Test #601 Link Status Test

Error Code	Test Result	Description / Recommendation
3	FAIL	Received no response to RSCL control link test frame. **1** Retry command at 1-minute intervals up to 5 times. **2** If the problem persists, reset the circuit pack (**reset board *UUCSS***). **3** If test continues to fail, replace the circuit pack.
	PASS	RSCL control link connected.

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VAL-PT (Voice Announcements over LAN Packet/Port)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
VAL-PT	MAJOR	**test port *location* long**	VAL Port Maintenance
VAL-PT	MINOR	**test port *location* long**	VAL Port Maintenance
VAL-PT	WARNING	**test port *location* short**	VAL Port Maintenance

1 For information on specifying a ***location***, see Command Syntax on page 179.

NOTE:
G700: Although the VAL-PT MO can reside in a G700 Media Gateway, neither of the tests described herein execute against a G700 VAL-PT.

S8300 / G700

For the G700, the MG-ANN (Voice Announcements) MO working with this maintenance object provides per board announcement storage time of up to 20 minutes (15 playback ports and 1 recording port that can also be used as a playback port), and allows for announcement file portability via LAN connectivity. MG-ANN also allows for LAN backup and restore of announcement files and the use of customer provided waveform (.WAV) files.

The MG-ANN hardware is located on the G700 motherboard. Communication Manager maintenance supports the MG-ANN by using a virtual board concept to allow for board insertion and maintenance testing. The virtual slot location is V9.

S8700 / S8500

An RSCL (remote socket control link) connects the VAL and the server to pass call-control and other management information. Because one link serves every port on the circuit pack, maintenance of the RSCL is part of the VAL circuit pack maintenance.

VAL Congestion Controls

The switch activates congestion controls on VAL when it detects buffers exceeding the threshold. The switch releases the congestion controls when the VAL reports that its buffer level has returned to normal levels.

If congestion:	Then the switch:
Persists for a 14-minute interval	Raises MINOR alarm
Exhausts buffers	Raises MINOR alarm
Ceases for 12 minutes	Retires MINOR alarm

Error Log Entries and Test to Clear Value

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	test port <*address*> l
1 *	0	SCOTCH Sync Loop-Around Test (#1275)	MINOR	ON	test port <*address*> l r 3
257 *	0		WARNING	OFF	
3585 *	0, 1	TDM Loop-Around Test (#1285)	MAJOR	ON	test port <*address*> l r 3

1 There is no short test sequence for this MO. Every test is available in the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Additional Information:

Error Type 1: SCOTCH Synchronous Loop-Around Test (#1275) failed.

1 Test the port (**test port** <***address***> **long**).

2 See SCOTCH Synchronous Loop-Around Test (#1275) on page 2060 repair procedures.

Error Type 257: VAL port detected overrun or underrun condition that can indicate a hardware problem.

1 Test for hardware problem (**test port** <***address***> **long**).

2 See SCOTCH Synchronous Loop-Around Test (#1275) on page 2060 repair procedures to verify repair.

3 Clear the alarm (**test port** <***address***> **long clear**).

Error Type 3585: TDM Port Loop-Around Test (#1285) failed.

1 Test the port (**test port** <***address***> **long**).

2 See the TDM Loop-Around Test (#1285) repair procedure.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate errors in the order listed in the table below.

Table 879: System Technician-Demanded Tests: VAL-PT

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
TDM Loop-Around Test (#1285) **G700**: On the G700, this test aborts with Error Code 1412**.**		X	D
SCOTCH Synchronous Loop-Around Test (#1275) **G700**: On the G700, this test aborts with Error Code 1412**.**		X	D

1 D = Destructive, ND = Nondestructive

TDM Loop-Around Test (#1285)

This test is **destructive**.

NOTE:
G700: On the G700, this test aborts with Error Code 1412**.**

This test verifies whether the VAL port can send and receive data on the TDM bus. This test has a tone generator send tones on a timeslot, and it has a tone receiver receive tones on another timeslot. The tones are looped through the record/playback port.

IF the received tones. . .	THEN . . .
Match the tones sent	The test passes.
Do not match the tones sent	The test fails.

Test failure indicates failure of one or more of the following components:

- VAL (TN2501) circuit pack
- TDM bus
- Tone generator / tone receiver circuit pack

Table 880: Test #1285 TDM Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. **1** Retry the command when the port is idle. You can force the port to the idle state with **busyout port <*address*>**. **2** Escalate if the problem persists. **Note:** This command is destructive, tearing down every call and link using the port.
1002	ABORT	No TDM bus timeslots available for the test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
1003	ABORT	No more tone receivers idle for use in this test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
G700: 1412	ABORT	On the G700, this test aborts with Error Code 1412..
2000	ABORT	Did not receive circuit pack test response within the allowable time period. **1** If this problem persists, reset the circuit pack (**busyout board <*address*>**, **reset board <*address*>**, and **release board <*address*>**). **2** Repeat the test. **3** If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
	FAIL	Received tones do not match transmitted tones. **1** Retry command at 1-minute intervals up to 3 times. **2** If the problem persists, see TDM-BUS (TDM Bus) on page 1832, TONE-PT (Tone Generator) on page 1927, and Tone Receiver repair procedures. **3** If the problem persists, reset the board (**busyout board <*address*>**, **reset board <*address*>**, and **release board <*address*>**). Repeat the test. **4** If the problem persists, replace the circuit pack.
	PASS	Port connections across the TDM bus function properly.

SCOTCH Synchronous Loop-Around Test (#1275)

This test is **destructive**.

NOTE:
G700: On the G700, this test aborts with Error Code 1412**.**

This test verifies the circuit in the data path of a VAL announcement port call. This test fails if the data transmitted on the port does not match the data received in the loop-around mode. Failure of this test indicates a port hardware fault on the circuit pack.

This test aborts if calls are using the port, or if the VAL link associated with the port is connected. To avoid this, at the SAT type **busyout port** <***address***>, which tears down every call and link using the port.

Table 881: Test #1275 SCOTCH Synchronous Loop-Around Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	The port is in use. **1** Retry the command when the port is idle. You can force the port to the idle state with **busyout port** <***address***>. **Note:** This command is **destructive**, tearing down every call and link using the port.
1002	ABORT	No TDM bus timeslots available for the test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.
G700: 1412	ABORT	On the G700, this test aborts with Error Code 1412**.**
1963	ABORT	The port is in use. **1** Retry the command when the port is idle. You can force the port to the idle state with **busyout port** <***address***>. **Note:** This command is **destructive,** tearing down every call and link using the port.
2000	ABORT	Did not receive circuit pack test response within the allowable time period. • If this problem persists, reset the circuit pack (**busyout board** <***address***>, **reset board** <***address***>, and **release board** <***address***>). • If the problem persists, replace the circuit pack.
2012	ABORT	Internal system error. **1** Retry the command at 1-minute intervals up to 3 times. **2** Escalate if the problem persists.
2100	ABORT	Could not allocate the necessary system resources to run test. **1** Retry the command at 1-minute intervals up to 5 times. **2** Escalate if the problem persists.

1 of 2

Table 881: Test #1275 SCOTCH Synchronous Loop-Around Test

Error Code	Test Result	Description / Recommendation
	FAIL	VAL circuit pack detected test failure. • If the problem persists, reset the circuit pack (**busyout board** <***address***>, **reset board** <***address***>, and **release board** <***address***>). • If the problem persists, replace the circuit pack.
	PASS	Port circuitry functioning properly.

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VC-BD

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
VC-BD	MAJOR	**test board *location* l *r#***	Voice Conditioner circuit pack
VC-BD	MINOR	**test board *location* l *r#***	Voice Conditioner circuit pack
VC-BD	WARNING[2]	**test board *location* s *r#***	Voice Conditioner circuit pack

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 See XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

CAUTION:
If the TN788 Voice Conditioner circuit pack (VC-BD) is not Vintage 2 or later, it must be replaced.

The TN788 Voice Conditioner circuit pack (VC-BD) is a service circuit pack that provides conditioning for the audio signals from multimedia equipment based on the CCITT H.221 standard. The TN788 transcodes, gain adjusts, and bridges the audio bit streams demultiplexed by the TN787 (MMI) circuit pack and transmits encoded, exclusive audio conference sums onto the TDM bus so that the MMI can multiplex the audio, video, and data streams for the H.221 endpoints.

Error Log Entries and Test to Clear Values

Table 882: VC-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** *UUCSS* **sh r 1**
1 (a)	Any	None	MINOR	ON	
18 (b)	0	**busyout board** *UUCSS*	WARNING	OFF	**release board** *UUCSS*
257 (c)	Any	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSS* **r 20**
513 (d)	4352 – 4357				
769 (e)	4358				
1025 (f)	4363	NPE Audit test (#50)			
1281 (g)	Any	SAKI Sanity test (#53)	MAJOR	ON	

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Table 882: VC-BD Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1293 – 1294 (h)	46088 – 46096	SAKI Sanity test (#53)	MINOR	ON	
1538 (i)	46082		MINOR	ON	

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1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Notes:

a The circuit pack stopped functioning or it was removed from the system. This alarm is logged approximately 11 minutes after the circuit pack is removed and/or the SAKI Sanity test (#53) fails.

To resolve this error, insert a circuit pack in the same slot as the error indicates, if the circuit pack is not already in the system. Or, if the circuit pack is in the system and the red LED is on, then follow instructions for Red alarms.

CAUTION:
If the TN788 Voice Conditioner circuit pack (VC-BD) is not Vintage 2 or later, it must be replaced.

b This circuit pack is busied out by **busyout board *UUCSS***.

c Transient communication problems exist between the switch and this circuit pack. Execute **test board *UUCSS*** and see the repair procedures for the Control Channel Loop-Around Test (#52) on page 2064.

d The circuit pack detected an on-board hardware failure. The reported aux data values correspond to the following detected errors:

Error	Description
4352	External RAM error
4353	Internal RAM error
4355	ROM Checksum error
4357	Instruction set error

Reset the circuit pack by executing **busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. When it is reset, the circuit pack executes a set of tests to detect the presence of any of the above faults. The detection of one these errors during initialization causes the circuit pack to lock-up and appear insane to the system. See the repair procedures in footnote (a) for error type 1.

e The circuit pack detects a program logic error. While no action is required, this error may lead to errors of other types being reported against this circuit pack.

f The circuit pack cannot update NPE memory and read it back. This error type can be ignored, but it may lead to other error types being reported against this circuit pack.

g A critical hardware failure has been detected on the circuit pack. Use **busyout board *UUCSS*, reset board *UUCSS***, followed by **release board *UUCSS***. If Test #53 passes, the on-board circuitry is healthy. Use **test board *UUCSS* long clear** to retire the alarm. If Test #53 fails, replace the circuit pack.

h The circuit pack detected a critical hardware failure. Reset the circuit pack with**busyout board *UUCSS***, **reset board *UUCSS***, and **release board *UUCSS***. If the Circuit Pack Restart test (#594) passes, then the on-board circuitry is healthy. Retire the alarm by issuing **test board *UUCSS* long clear**. If the Circuit Pack Restart test (#594) fails, replace the circuit pack.

The reported error types correspond to the following detected errors:

Error	Description
1293	On-board auxiliary processor insane
1294	Internal memory access error

i The circuit pack is hyperactive — it is flooding the switch with messages sent over the control channel. The circuit pack is taken out of service when a threshold number of these errors is reported to the switch. Clear the alarm by using **busyout board *UUCSS***, **reset board *UUCSS***, **test board *UUCSS* long clear**, and **release board *UUCSS***. If the error recurs within 10 minutes, then replace the circuit pack.

System Technician-Demanded Tests: Descriptions and Error Code

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
Control Channel Loop-around test (#52)[1]	X	X	Nondestructive

1 See repair procedures described in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086.

CAUTION:

If the TN788 Voice Conditioner circuit pack (VC-BD) is not Vintage 2 or later, it must be replaced.

Control Channel Loop-Around Test (#52)

See the repair procedure described in XXX-BD (Common Port Circuit Pack/Media Module) on page 2086 as Control Channel Loop-Around Test (#52).

VC-DSPPT

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
VC-DSPPT	MAJOR	**test port *location***	Voice Conditioner DSP Port
VC-DSPPT	MINOR	**test port *location***	Voice Conditioner DSP Port
VC-DSPPT	WARNING	**test port *location***	Voice Conditioner DSP Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

Each Voice Conditioner circuit pack (VC-BD) provides two types of resources:

- Transcoder Resources used for encoding and decoding audio formats
- Summer Resources used for summing audio from different sources

The eight Voice Conditioner DSP ports are the transcoder resources on the VC-BD.

Error Log Entries and Test to Clear Values

Table 883: VC-DSPPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
18 (a)	0	**busyout port** *UUCSSpp*	WARNING	OFF	**release port** *UUCSSpp*
257 (b)	Any	NPE Crosstalk test (#6)	MINOR	ON	**test port** *UUCSSpp* **1 r 3**
513 (c)	Any	VC DSP Port Local TDM Loopback test (#1104)	MINOR	ON	**test port** *UUCSSpp* **sh r 3**
778 – 781 (d)	Any	VC Port Reset DSP test (#1106)	MAJOR	ON	**See note (d)**
1025 (e)			WARNING	ON	
1281 (f)	Any	VC DSP Port DSP Loopback test (#1105)	MINOR	ON	**test port** *UUCSSpp* **sh r 3**
3840 (g)					

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Notes:

a This port has been busied out by **busyout port *UUCSSpp***.

b The VC DSP Port NPE Crosstalk test (#1103) failed.

c The VC DSP Port Local TDM Loopback test (#1104) failed. Run the long test sequence.

d A critical hardware failure has been detected on the circuit pack. Reset the port by **busyout port *UUCSSpp*** and **reset port *UUCSSpp***. If the VC Reset DSP test (#1106) passes, then the on-board circuitry is healthy. Retire the alarm with **test port *UUCSSpp* long clear**.

e The VC DSP port reported loss of framing on the Service Channel between the VC and MMI circuit packs.

f The VC DSP Port DSP Loopback test (#1105) failed.

g The DSP corresponding to this port on the VC circuit pack reported a firmware error. No action is required.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below. By clearing error codes associated with the DSP NPE Crosstalk test (#1103), you may clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
DSP NPE Crosstalk test (#1103)		X	D
TDM Loopback test (#1104)	X	X	D
DSP Loopback test (#1105)	X	X	D

1 D = Destructive; ND = Nondestructive

DSP NPE Crosstalk Test (#1103)

This test is **destructive**.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of the port's long test sequence and takes approximately 20 to 30 seconds to complete.

Table 884: Test #1103 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000 **S8100**: 1000, 1001	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 884: Test #1103 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
S8100: 0-3	FAIL	The NPE of the tested port was transmitting in error, causing noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** To be sure that this is not an intermittent problem, repeat this test up to 10 times. **2** If complaints still persist, examine the station, connections, and wiring.

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VC DSP Port Local TDM Loop-Back Test (#1104)

This test is **destructive**.

This test verifies the connectivity of a VC DSP Port across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack. The Loopback test runs the following tests:

1 A Loop-Around test across the TDM bus.

2 A conference Circuit test.

The tests are run in the above order; if one test fails, an error code is returned and the remaining tests in the sequence are not executed.

Figure 157: VC Circuit Pack DSP Port Local TDM Loop-Back Test

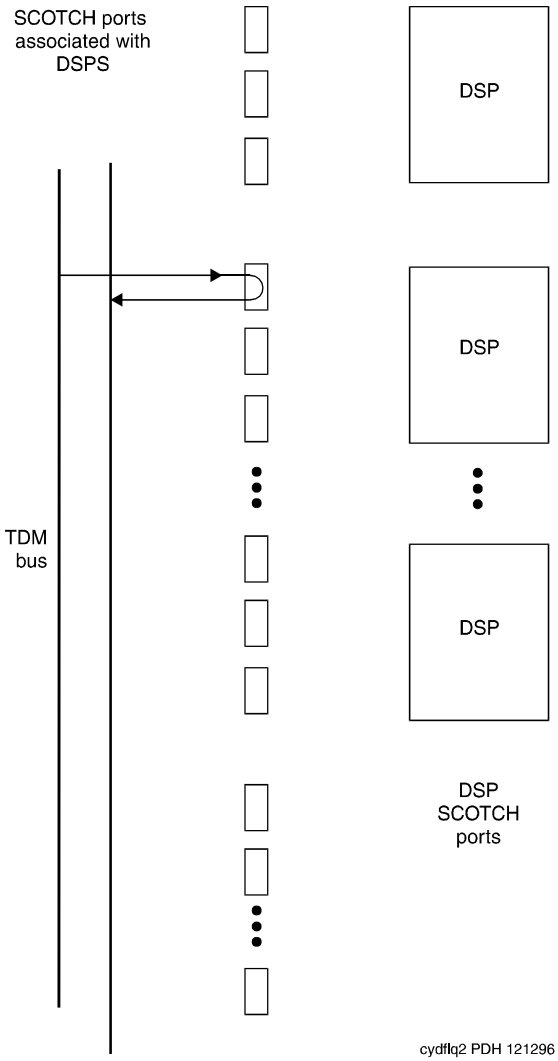

Table 885: Test #1104 VC DSPPT Local TDM Loop-Back Test

Error Code	Test Result	Description / Recommendation
1000 1001	ABORT	System resources required to run this test are not available, or the port is busy with a valid call. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The traffic load on the system is very high, or time slots may be out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, repeat the test at 1-minute intervals up to 5 times.

1 of 2

Table 885: Test #1104 VC DSPPT Local TDM Loop-Back Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a Tone Detector for the test. The system is oversized for the number of Tone Detectors present, or some Tone Detectors are out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port is seized by a user for a valid call. Use **status station** for the station associated with this port and determine whether the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test was not received from the VC-BD circuit pack within the allowable time period. **1** If this result occurs repeatedly, attempt to reset the port by using **busyout port *UUCSSpp*** and **reset port *UUCSSpp*.** **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times.
0–3	FAIL	The TDM Loop-Around test failed. **1** Replace circuit pack.
4–7	FAIL	The Conference Circuit test failed. **1** Replace circuit pack.
	PASS	The VC DSP Port Local TDM Loop-Around test passed.

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VC-DSP Port DSP Loop-Back Test (#1105)

This test is **destructive**.

This test verifies the connectivity of a VC-DSPPT across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack.

Figure 158: VC Circuit pack DSP Port DSP Loop-Around Test

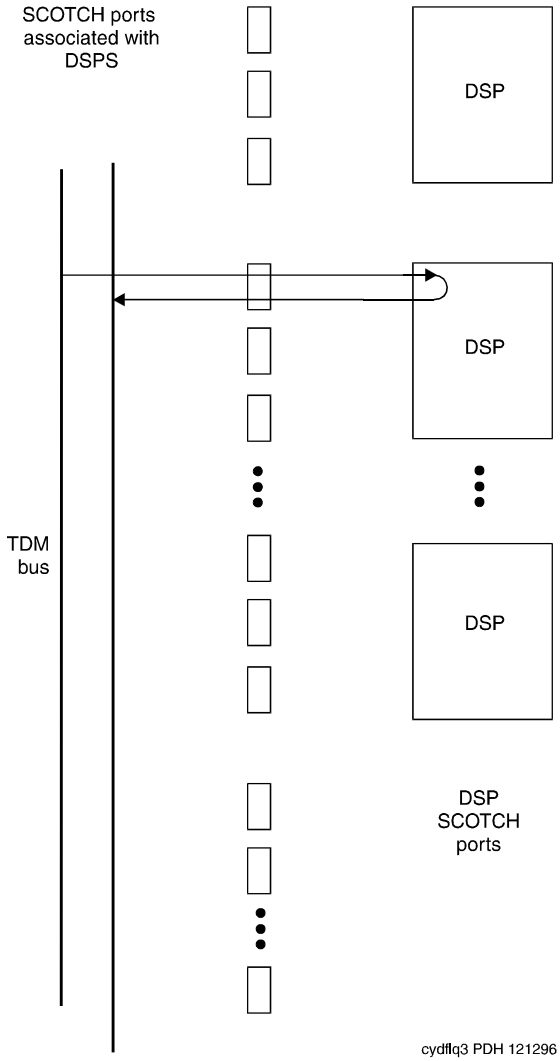

Table 886: Test #1105 VC-DSP Port DSP Loop-Back Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available, or the port is busy with a valid call. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test, the traffic load on the system is very high, or time slots are out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.

1 of 2

Table 886: Test #1105 VC-DSP Port DSP Loop-Back Test

Error Code	Test Result	Description / Recommendation
1003	ABORT	The system could not allocate a Tone Detector for the test, the system is oversized for the number of Tone Detectors present, or some Tone Detectors are out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** for the station associated with this port and determine whether the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received from the VC-BD circuit pack within the allowable time period. **1** If this result occurs repeatedly, reset the circuit pack if the other ports are idle by using **busyout port *UUCSSpp*** and **reset port *UUCSSpp***. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
0, 1	FAIL	The VC-DSPPT DSP Loopback test failed. **1** Replace the circuit pack.
	PASS	The VC DSPPT DSP Loopback test passed

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VC Port Reset DSP Test (#1106)

This test is **destructive**.

This test resets the VC-DSPPT and the DSP associated with it. As part of the reset procedure, the VC-DSPPT will execute a series of self-tests on the hardware. If these self-tests fail, the test will fail; otherwise the test will pass.

Before executing the test, the VC-DSPPT must be busied out by executing **busyout port *UUCSSpp***. After the completion of the test, the VC-DSPPT must be released by executing **release port *UUCSSpp***.

Table 887: Test #1106 VC Port Reset DSP Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available, or the port may be busy with a call. **1** Retry the command at 1-minute intervals up to 5 times.
1015	ABORT	The VC-DSPPT is not busied out. **1** Busyout the VC-DSPPT by executing **busyout port *UUCSSpp***, then retry the test.
2000	ABORT	Response to the test was not received from the VC-DSPPT within the allowable time period. **1** Retry the command at 1-minute intervals up to 5 times. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The reset of the VC-DSPPT was unsuccessful. **1** Replace circuit pack.
	PASS	The VC-DSPPT was successfully reset. **1** Release the VC-DSPPT by executing **reset port *UUCSSpp***.

VC-LEV (Voice Conditioner DSP Port Level)

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial Command to Run	Full Name of MO
VC-LEV	MAJOR	See Resolving VC-LEV Errors/Alarms	VC-LEV

The MMCH feature must be enabled on the ***system-parameters customer-options*** screen before you can change these fields.

The Voice Conditioner (VC) Port Level MO monitors VC efficiency by tracking the number of VC ports that are in-service, and then comparing that number with the value entered in the VC field on the System-Parameters Maintenance screen. This `VCs` field is located under the Minimum Maintenance Thresholds section. The `VCs` field contains the minimum number of VC ports needed for the Multimedia Call Handling (MMCH) feature, and is an administrable field. The `VCs` field must contain a number between 0 and 126, and is entered by the system administrator. The MMCH feature must be enabled on the System-Parameters Customer-Options screen before the `VCs` field can be changed to a number greater than 0. For example, administering 8 in that field means 1 circuit pack. The algorithm for determining that a low level of VC resources exists uses the number entered in the `VCs` field, and the number of VCs that are in-service in the system.

Each VC circuit pack contains 16 physical ports: 8 ports are reserved for VC-DSPPT ports, and the remaining 8 ports are designated as VC-SUMPT ports. The 8 DSP ports are made up of 4 encoder and 4 decoder resources that encode and decode audio formats. Thus, *one VC circuit pack is required for every 8 ports of MMCH port capacity.* If the number of in-service VC ports falls below the MMCH port capacity (value entered on the System-Parameters Maintenance screen under the Minimum Maintenance Thresholds section and in the `VCs` field), a VEC-LEV error is logged. If this outage continues for 15 minutes a MAJOR alarm is raised.

Resolving VC-LEV Errors/Alarms

VC ports are a key part of the MMCH feature, any loss in the number of ports available for use degrades the MMCH customer defined service level.

If a VC circuit pack or port is busied out using **busyout board** or **busyout port**, these out-of-service ports are not included in the VC level calculation, thus allowing a technician to busyout a VC circuit pack for maintenance reasons without causing a MAJOR alarm to be raised.

> **NOTE:**
> When diagnosing a VC-LEV problem, resolve any alarms raised against VC-BD or VC-DSPPT MOs. Clearing VC-BD or VC-DSPPT alarms may clear the VC-LEV alarm.

The VC circuit pack is maintained by the software similarly to the Tone Detector circuit pack. Tone Detector circuit packs may be removed and reinserted in any port-board slot without administration. The same rule applies to VC circuit packs. If a VC circuit pack is removed from service logically (by failing the Archangel sanity scan test) or is removed from service physically (by physically removing the circuit pack from the carrier), no error/alarm is raised against VC-BD or VC-DSPPT MOs. Therefore, if a VC-LEV error/alarm exists, and none has been raised against VC-BD or VC-DSPPT MOs, a VC circuit pack may have been removed from service causing the VC-LEV error/alarm. To resolve a VC-LEV MAJOR

alarm, restore the number of VC ports available for service to be equal to or more than the calculated port capacity (value entered in the VCs field).

To determine how many VC circuit packs are needed for the MMCH feature:

1. Display the System-Parameters Maintenance screen by executing **display system-parameters maintenance**.
2. Locate the number listed in the Minimum Maintenance Threshold (VCs) field. The MMCH feature requires one VC circuit pack for each four ports listed in the Minimum Maintenance Threshold (VCs) field.
3. Divide the Minimum Maintenance Threshold value by 8 to determine the number of VC circuit packs needed. For example, a port capacity of 12 listed in the Minimum Maintenance Threshold (VCs) field would require 2 VC circuit packs.
4. Use **list configuration** to verify that the number of VC circuit packs listed agrees with the required number of VC circuit packs (determined in step 3). If the number of VC circuit packs listed in the step 3 differs from the calculated number, restore the number of VC circuit packs to the correct value, in order to resolve the VC-LEV alarm.

Error Log Entries and Test to Clear Values

Table 888: VC-LEV Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
1 (a)	Any	None	MAJOR	OFF	

Error Notes:

a The number of VC resources in the system that are in service has fallen below the calculated minimum value. If the number of in-service VC ports falls below the MMCH port capacity (value entered in the Minimum Maintenance Threshold VCs field on the system parameters maintenance screen), a VEC-LEV error is logged.

If this outage continues for 15 minutes a MAJOR alarm is raised. To resolve this alarm, correct the out-of-service problem:

1. See VC-DSPPT on page 2065 and VC-BD on page 2062 to resolve any associated alarms.
2. If a VC-LEV error/alarm exist and none has been raised against VC-BD or VC-DSPPT MOs, a VC circuit pack may have been removed from service causing the VC-LEV error/alarm. To resolve a VC-LEV MAJOR alarm, restore the number of VC ports available for service to be equal to or more than the calculated port capacity. See Resolving VC-LEV Errors/Alarms on page 2073 for details.

System Technician-Demanded Tests: Descriptions and Error Code

There are no System Technician-Demanded test for VC-LEV.

VC-SUMPT

S8700 / S8500 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
VC-SUMPT	MAJOR	**test port *location***	Voice Conditioner Summer Port
VC-SUMPT	MINOR	**test port *location***	Voice Conditioner Summer Port
VC-SUMPT	WARNING	**test port *location***	Voice Conditioner Summer Port

1 For information on specifying a ***location***, see Command Syntax on page 179.

Each Voice Conditioner circuit pack (VC-BD) provides two types of resources:

- Transcoder Resources that are used for encoding and decoding audio formats
- Summer Resources that are used for summing audio formats from different sources.

The Voice Conditioner Summer ports (VC-SUMPT) are the summer resources on the VC-BD. There are 8 such ports on a VC-BD.

Error Log Entries and Test to Clear Values

Table 889: VC-SUMPT Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test port** *UUCSSpp* **sh r 1**
18 (a)	0	**busyout port** *UUCSS*	WARNING	OFF	**release port** *UUCSSpp*
130 (b)			WARNING	ON	**test port** *UUCSSpp* **sh**
257 (c)	Any	Control Channel Loop test (#52)	MINOR	ON	**test board** *UUCSSpp* **1 r 3**
513 (d)	Any	VC Summer Port Local Loopback test (#1100)	MINOR	ON	**test board** *UUCSSpp* **sh r 3**

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Error Notes:

a This port has been busied out with **busyout port *UUCSSpp***.

b The circuit pack has been removed or has been insane for more than 11 minutes. To clear the error, replace or reinsert the circuit pack.

c The NPE Crosstalk test (#1103) failed.

d The VC Summer Port Local TDM Loopback test (#1100) failed.

System Technician-Demanded Tests: Descriptions and Error Codes

Investigate tests in the order listed below. By clearing error codes associated with the NPE Crosstalk test (#6), you may lear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND
NPE Crosstalk test (#6)		X	Destructive
TDM Loopback test (#1100)	X	X	Destructive

VC-SUMPT Port NPE Crosstalk Test (#6)

This test is **destructive**.

The NPE controls port connectivity and gain and provides conferencing functions. The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot and never crosses over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is part of the port's long test sequence and takes approximately 20 to 30 seconds to complete.

Table 890: Test #6 VC-SUMPT Port NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1000 1001 **S8100**: 1000 only	ABORT	System resources required to run this test are not available. The port may be busy with a valid call. **1** Retry the command at 1-minute intervals up to 5 times.
2012	ABORT	Internal system error
2100	ABORT	Could not allocate the necessary resources for this test. **1** Retry the command at 1-minute intervals up to 5 times.
0–3 **S8100**: (blank)	FAIL	The NPE of the tested port was transmitting in error. This causes noisy and unreliable connections. **1** Replace circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** Verify that this is not an intermittent problem by repeating this test up to 10 times. **2** If complaints continue, examine the station, connections, and wiring.

VC Summer Port Local TDM Loopback Test (#1100)

This test is **destructive**.

This test verifies the connectivity of a VC Summer Port across the TDM bus. It aborts if calls associated with the port are in progress. Failure of this test indicates an on-board fault associated with the port hardware on the circuit pack. The Loopback test runs the following tests:

- A Loop-Around test across the TDM bus.
- A conference circuit test.

The tests are run in the above order. If the first test fails, the switch returns an error code, and the second test is not executed.

Figure 159: VC Circuit Pack Summer Port Loop-Back Test

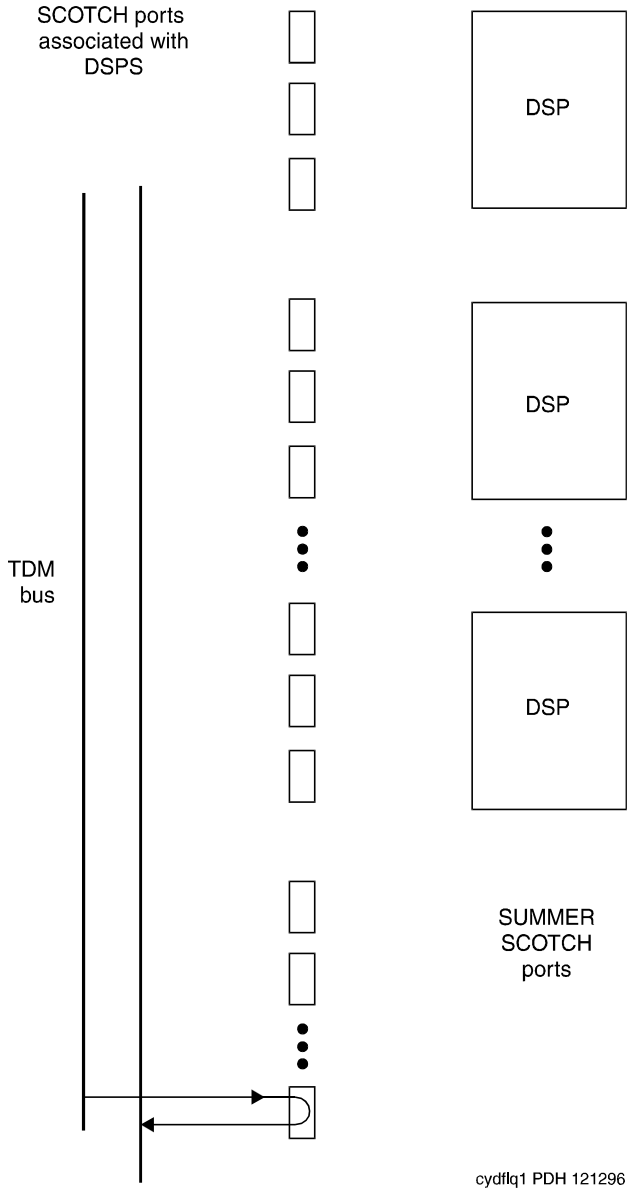

Table 891: Test #1100 VC Summer Port Local TDM Loop-Back Test

Error Code	Test Result	Description / Recommendation
1000	ABORT	System resources required to run this test are not available, or the port may be busy with a valid call. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 891: Test #1100 VC Summer Port Local TDM Loop-Back Test

Error Code	Test Result	Description / Recommendation
1002	ABORT	The system could not allocate time slots for the test. The traffic load on the system is very high, or time slots are out-of-service due to TDM-BUS errors. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a Tone Detector for the test, the system is oversized for the number of Tone Detectors present, or some Tone Detectors are out-of-service. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status station** for the station associated with this port to determine whether the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.
2000	ABORT	Response to the test request was not received from the VC-BD circuit pack within the allowable time period. **1** If this result occurs repeatedly, reset the circuit pack if the other ports are idle. Reset the circuit pack by issuing **busyout board *UUCSS*** and **reset board *UUCSS***. **2** If this result occurs again, replace the circuit pack.
2012	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
2103	ABORT	The system could not make the conference connection for the test. **1** Retry the command at 1-minute intervals up to 5 times.
0	FAIL	The TDM Loop-Around test failed.
1	FAIL	The Conference Circuit test failed. **1** Replace circuit pack.
	PASS	The VC Summer Port Local TDM Loopback test passed.

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WAE-PORT (Wideband Access Endpoint Port)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
WAE-PORT	MINOR	**test access-endpoint *extension* l**	Wideband Access
WAE-PORT	WARNING	**test access-endpoint *extension***	Endpoint Port

1 For additional repair information, see also DIG-BD (Digital Line Circuit Pack) on page 709 and MG-DS1 (DS1 Interface Media Module) on page 1255.

Wideband Switching supports end-to-end connectivity between customer endpoints at data rates from 128 to 1536 kbps over T1 facilities and to 1984 kbps over E1 facilities. Communication Manager switching capabilities support wideband calls comprised of multiple DS0s that are switched end-to-end as a single entity.

Wideband Switching extends the Administered Connections feature to include non-signaling wideband access endpoints. Endpoint application equipment with direct T1 or E1 interfaces may connect directly to the switch's line-side facilities; application equipment without T1 or E1 interfaces requires a terminal adapter such as a DSU/CSU. The terminal adapter or endpoint application equipment is connected to the TN464C Universal DS1 circuit pack, and to the MM710 DS1 Interface Media Module (**G700**).

NOTE:
G700: Although the WAE-PORT MO is provided for a G700 Media Gateway, this MO only partially supports the MM710 DS1 Media Module.

These endpoints are administered as wideband access endpoints and have no signaling interface to switch; they simply transmit and receive data. (Some applications detect and respond to the presence or absence of data). Calls are initiated from these endpoints using the Administered Connections feature.

Multiple access endpoints on one line-side UDS1 circuit pack or MM710 Media Module facility are separate and distinct within the facility. Endpoint application equipment must be administered to send and receive the correct data rate over the correct DS0s. Every Administered Connection originating from a wideband access endpoint uses the entire bandwidth administered for the endpoint. An incoming call with a different data rate than that administered for the endpoint cannot be routed to the endpoint.

Although Wideband Access Endpoints are used primarily for line-side facilities, these endpoints can also be administered on network DS1 facilities to connect Communication Manager to non-switched network services, such as the Avaya fractional T-1 service. An example of this is the Avaya Static Integrated Network Access, where a trunk group to AT&T 4ESS Switched Services shares an access T-1 facility with a Wideband Access Endpoint. In this case, the Wideband Access Endpoint is connected to the AT&T fractional T-1 service, and it does not terminate on local endpoint equipment, but is connected to a far-end CPE via the dedicated fractional T-1. All Wideband Access Endpoint functionality and operation is identical on both line-side and network facilities. However, because maintenance capabilities are limited to the Wideband Access Endpoint interface, and because faults can occur end-to-end, troubleshooting procedures based on an end-to-end view of the network is required.

Wideband access endpoint port maintenance provides a strategy to maintain a wideband access endpoint port via a port on the Universal DS1 interface circuit pack or the MM710 DS1 Interface Media Module

hardware. The maintenance strategy covers logging wideband access endpoint port hardware errors, running tests for port initialization, periodic and scheduled maintenance, demand tests, and alarm escalation and resolution. Two different port service states are specified in the wideband access endpoint port maintenance:

- *out-of-service*: the port is in a deactivated state and cannot be used for calls
- *in-service*: the port is in an activated state and can be used for calls

  If the UDS1 Interface circuit pack or the MM710 DS1 Interface Media Module is out of service, every port on it is taken out of service, and a Warning alarm is raised.

Error Log Entries and Test to Clear Values

Table 892: Wideband Access Endpoint Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test access-endpoint *extension* sh r 1**
18 *	0	**busyout access-endpoint <*extension*>**	WARNING	OFF	**release access-endpoint *extension***
130 *		None	WARNING	ON	**test access-endpoint *extension***
1281 *		Conference Circuit Test (#7)	MINOR	ON	**test access-endpoint *extension* l r 4**
1537 *		NPE Crosstalk Test (#6)	MINOR	ON	**test access-endpoint *extension* l r 3**
1793 *		None			**test board *location*[2] long**
3840 *	Any	Port Audit and Update Test (#36)			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

2. For information on specifying a ***location***, see Command Syntax on page 10.

Error Additional Information:

Error Type 18: The wideband access endpoint has been busied out by **busyout access-endpoint <*extension*>**. No calls can be made to this extension.

Error Type 130: The circuit pack or media module has been removed or has been insane for more than 11 minutes. To clear the error, reinsert or replace the circuit pack or media module.

Error Type 1281: The Conference Circuit test (#7) failed on this port. See Test #7 for repair procedures.

Error Type 1537: The NPE Crosstalk test (#6) failed on this port. See Test #6 for repair procedures.

Error Type 1793: The TN464C UDS1 Interface circuit pack or the MM710 DS1 Interface Media Module has failed. See UDS1-BD (UDS1 Interface Circuit Pack) on page 1950 or MG-DS1 (DS1 Interface Media Module) on page 1255.

Error Type 3840: The Port Audit and Update test (#36) failed due to an internal system error. Enter **status access-endpoint** <***extension***> and verify the status of the port. If the wideband access endpoint port is out of service, enter **release access-endpoint** <***extension***> to put it back into service. Retry the test command.

System Technician-Demand Tests: Descriptions and Error Codes

Investigate tests in the order listed below when inspecting errors in the system. By clearing error codes associated with the *NPE Crosstalk* test (#6), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	D/ND[1]
NPE Crosstalk test (#6) **G700**: On the G700, this test aborts with Error Code 1412.		X	ND
Conference Circuit test (#7) **G700**: On the G700, this test aborts with Error Code 1412.		X	ND
Port Audit and Update test (#36)	X	X	ND

1 D = Destructive; ND = Nondestructive

NPE Crosstalk Test (#6)

NOTE:
G700: On the G700, this test aborts with Error Code 1412.

The NPE Crosstalk test verifies that this port's NPE channel talks on the selected time slot, and does not cross over to time slots reserved for other connections. If the NPE is not working correctly, 1-way and noisy connections may be observed. This test is usually part of a port's long test sequence and takes 20 to 30 seconds to complete

Table 893: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use **status access-endpoint** <***extension***> to determine when the port is available for testing. **1** Retry the command at 1-minute intervals up to 5 times.

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Table 893: Test #6 NPE Crosstalk Test

Error Code	Test Result	Description / Recommendation
1001	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1002	ABORT	The system could not allocate time slots for the test. The system may be under heavy traffic conditions or it may have time slots out-of-service due to TDM-BUS errors. Use **status health** to determine whether the system is experiencing heavy traffic. **1** If the system has no TDM-BUS errors and is not handling heavy traffic, retry the command at 1-minute intervals up to 5 times.
1003	ABORT	The system could not allocate a tone receiver for the test. The system may be too big for the number of Tone Detectors present, or some Tone Detectors may be out of service. **List measurement tone-receiver** shows information about the system's tone receivers. **1** Resolve any TTR-LEV errors. **2** Resolve any TONE-PT errors. **3** If neither condition exists, retry the command at 1-minute intervals up to 5 times.
1004	ABORT	The port has been seized by a user for a valid call. Use **status access-endpoint <*extension*>** to determine when the port is available for testing. The port is available when it is in the **in-service/idle** state. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run because of a previously existing error on the specific port or a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or the circuit pack and attempt to diagnose the already existing error.
G700: 1412	ABORT	On the G700, this test aborts with Error Code 1412.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The NPE of the tested port was found to be transmitting in error. This causes noisy and unreliable connections. **1** Replace the circuit pack.
	PASS	The port is correctly using its allocated time slots. **1** Investigate user-reported troubles on this port using other port tests and by examining the terminal adapter or external wiring.

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Conference Circuit Test (#7)

NOTE:
G700: On the G700, this test aborts with Error Code 1412.

The Conference Circuit test verifies that the NPE channel for the port being tested can correctly perform the conferencing function. The NPE is instructed to listen to several different tones and conference the tones together. The resulting signal is then measured by a Tone Detector port. If the level of the tone is within a certain range, the test passes.

Table 894: Test #7 Conference Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1000	ABORT	System resources required to run this test are not available. The port may be in use on a valid call. Use the **status access-endpoint <*extension*>** to determine when the port is available for testing.
1004	ABORT	The port has been seized by a user for a valid call. Use **status access-endpoint <*extension*>** to determine when the port is available for testing. The port is available when it is in the **in-service/idle** state. **1** Retry the command at 1-minute intervals up to 5 times.
1020	ABORT	The test did not run due to a previously existing error on the specific port or because of a more general circuit pack error. **1** Examine the Error Log for existing errors against this port or circuit pack, and attempt to diagnose the previously existing error.
G700: 1412	ABORT	On the G700, this test aborts with Error Code 1412.
2000	ABORT	Response to the test was not received within the allowable time period.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The NPE of the tested port did not conference the tones correctly. This causes noisy and unreliable connections. Even though wideband calls do not use the conferencing feature on the NPE, this failure indicates problems with the circuit pack hardware. **1** Replace the circuit pack.
	PASS	The port can correctly conference multiple connections. **1** Investigate user-reported troubles on this port using other port tests and by examining the terminal adapter or external wiring.

Port Audit and Update Test (#36)

This test sends port level translation data from switch processor to the UDS1 Interface circuit pack to ensure that the wideband access endpoint port's translation is correct.

Table 895: Test #36 Port Audit and Update Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
1006	ABORT	The port is out-of-service. If the port is busied out: **1** Issue **release access-endpoint <*extension*>** to put the port back into in-service. **2** Retry the test command. If the port is not busied out: **1** Check the error and alarm logs for WAE-PORT, and UDS1-BD or MG-DS1 errors and alarms and follow the recommended repair procedures.
2000	ABORT	Response to the test request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	Port translation has been updated successfully.
Any	NO BOARD	The test could not relate the internal ID to the port (no board). This could be due to incorrect translations, no board is inserted, an incorrect board is inserted, or an insane board is inserted. Ensure that the board translations are correct. Execute the **add ds1 <address>** command to administer the board interface if it is not already administered. If the board was already administered correctly, check the error log to determine whether the board is hyperactive. If this is the case, the board is shut down. Reseating the board will re-initialize the board. If the board was found to be correctly inserted in step 1, then issue the **busyout board <address>** command. Issue the **reset board <address>** command. Issue the **release board <address>** command. Issue the **test board <address> long** command. This should re-establish the linkage between the internal ID and the port.

XXX-BD (Common Port Circuit Pack/Media Module)

S8700 / S8500 / S8300 / S8100

MO's Name (in Alarm Log)	Alarm Level	Initial SAT Command to Run[1]	Full Name of MO
XXX-BD[2]	MAJOR	**test board *location***	Common Port Circuit Pack/Media Module maintenance
XXX-BD[2]	MINOR	**test board *location***	Common Port Circuit Pack/Media Module maintenance
XXX-BD[2]	WARNING	**test board *location***	Common Port Circuit Pack/Media Module maintenance

1 For information on specifying a ***location***, see Command Syntax on page 179.

2 Refer to the appropriate circuit pack or media module documentation for the correct MO name displayed in this field. It usually ends with BD.

Common Port Circuit Pack maintenance is a set of common tests used by every circuit pack or media module listed in the following tables. The common portion of these circuit packs is the generic hardware that interfaces with the TDM bus. The XXX-BD designation is also used on SAT displays when **reset board** is entered with an empty circuit pack or media module slot, or with a circuit pack or media module type that is in conflict with the actual board type administered for that slot. Every circuit pack or media module suffix (B,C, D, and so forth) are supported by "XXX-BD."

When any of the Common Port circuit packs are physically removed from the backplane, no alarm will be logged for approximately 11 minutes. In the case of the following, approximately 21 minutes will elapse before an alarm is logged:

- TN754 Digital Line,TN566 EMBEDDED AUDIX, and TN758 Pooled Modem circuit packs for systems suporting circuit packs
- **G700**: MM712 Digital Line, MM720, and INTUITY AUDIX for systems supporting media modules

When a circuit pack or media module that has been removed is alarmed, the alarm type is minor and is classified as an on-board alarm. The time delay permits maintenance activity to be performed without triggering an additional alarm.

Alarms are logged against only those common port circuit packs or media modules on which ports have been administered. In a heavily loaded system, the interval between the removal of a Common Port circuit pack or media module and the logging of the alarm may be several minutes longer. The circuit packs in Table 896, XXX-BD Common Circuit Packs, on page 2087 contain ports on the TDM bus. Suffixes are not shown; for a list of every circuit pack supported, see the table in Circuit packs in *Maintenance Procedures (555-245-103)*.

Those that appear in **bold** type are documented separately under their own MO name. The circuit packs in Table 896, XXX-BD Common Circuit Packs, on page 2087 are listed by apparatus code.

Table 896: XXX-BD Common Circuit Packs

Apparatus Code	Name	Type
CPP1	Memory Expansion	Control
ED-1E546 (TN2169) (TN2170) (TN566) (TN567)	EMBEDDED AUDIX R3 System	Port Assembly
ED-1E546 (TN2208) (TN2170)	Call Visor ASAI over the DEFINITY (LAN) Gateway R1	Port Assembly
TN417	Auxiliary Trunk	Port
TN419B	Tone-Clock	Control
TN420B/C	Tone Detector	Service
TN429	Direct Inward/Outward Dialing (DIOD) Trunk	Port
TN433	Speech Synthesizer	Service
TN436B	Direct Inward Dialing Trunk	Port
TN437	Tie Trunk	Port
TN438B	Central Office Trunk	Port
TN439	Tie Trunk	Port
TN447	Central Office Trunk	Port
TN457	Speech Synthesizer	Service
TN458	Tie Trunk	Port
TN459B	Direct Inward Dialing Trunk	Port
TN464C/D/E/F	DS1/E1 Interface – 24-channel T1, 32-channel E1	Port
TN465/B/C	Central Office Trunk	Port
TN467	Analog Line	Port
TN468B	Analog Line	Port
TN479	Analog Line	Port
TN497	Tie Trunk	Port
TN556/B	ISDN-BRI 4-Wire S/T-NT Line (A-Law)	Port
TN722B	Digital Signal Level 1 Tie Trunk	Port
TN725B	Speech Synthesizer	Service
TN726/B	Data Line	Port
TN735	MET Line	Port
TN742	Analog Line	Port
TN744/B	Call Classifier	Service
TN744/C/D	Call Classifier - Detector	Service

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Table 896: XXX-BD Common Circuit Packs

Apparatus Code	Name	Type
TN746/B	Analog Line	Port
TN747B	Central Office Trunk	Port
TN748/B/C/D	Tone Detector	Service
TN750/B/C	Announcement	Service
TN753	Direct Inward Dialing Trunk	Port
TN754/B	Digital Line 4-Wire DCP	Port
TN756	Tone Detector	Service
TN758	Pooled Modem	Port
TN760B/C/D	Tie Trunk	Port
TN762B	Hybrid Line	Port
TN763B/C/D	Auxiliary Trunk	Port
TN767B/C/D/E	DS1 Interface - T1, 24 Channel	Port
TN769	Analog Line	Port
TN771D	Maintenance/Test	Service
TN777/B	Network Control	Control
TN778	Packet Control	Control
TN787F	Multimedia Interface	Service
TN788/B	Multimedia Voice Conditioner	Service
TN789	Radio Controller	Control
TN793	Analog Line, 24-Port, 2-Wire	Port
TN797	Analog Trunk and Line	Port
TN800	Multi-Application Platform for DEFINITY (MAPD)	Service
TNPRI/BRI	PRI-to-BRI Converter	Port
TN2135	Analog Line	Port
TN2136	Digital Line 2-Wire DCP	Port
TN2138	Central Office Trunk	Port
TN2139	Direct Inward Dialing Trunk	Port
TN2140/B	Tie Trunk	Port
TN2144	Analog Line	Port
TN2146	Direct Inward Dialing Trunk	Port
TN2147/C	Central Office Trunk	Port
TN2149	Analog Line	Port
TN2180	Analog Line	Port
TN2181	Digital Line 2-Wire DCP	Port

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Table 896: XXX-BD Common Circuit Packs

Apparatus Code	Name	Type
TN2183	Analog Line	Port
TN2184	DIOD Trunk	Port
TN2198	ISDN-BRI 2-Wire U Interface	Port
TN2199	Central Office Trunk	Port
TN2202	Ring Generator	Power
TN2224	Digital Line, 24-Port, 2-Wire DCP	Port

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Additional circuit packs specific to S8700 MC systems are listed in Table 897, XXX-BD Common Circuit Packs - S8700 MC Specific, on page 2089.

Table 897: XXX-BD Common Circuit Packs - S8700 MC Specific

Apparatus Code	Name	Type
TN570/B/C	Expansion Interface	Port
TN572	Switch Node Clock	Control
TN573/B	Switch Node Interface	Control
TN574	DS1 Converter - T1, 24 Channel	Port
TN755B	Neon Power Unit	Power
TN768	Tone-Clock	Control
TN775/B	Maintenance	Service
TN776	Expansion Interface	Port
TN780	Tone-Clock	Control
TN1654	DS1 Converter - T1, 24 Channel/E1, 32 Channel	Port
TN2182/B	Tone-Clock, Tone Detector, and Call Classifier	Control

Table 898, XXX-BD Common Media Modules, on page 2089 lists common media modules by apparatus code

Table 898: XXX-BD Common Media Modules

Apparatus Code	Name	Type
MM710	DS1/E1 Interface - T1, 24 Channel - E1, 32 Channel,	Port
MM711	Analog Trunk and Line	Port
MM712	Digital Line, 8-Port, 2-Wire DCP	Port

Error Log Entries and Test to Clear Values

Table 899: Common Port Circuit Pack Maintenance Error Log Entries

Error Type	Aux Data	Associated Test	Alarm Level	On/Off Board	Test to Clear Value
0[1]	0	Any	Any	Any	**test board** <*address*> **sh r 1**
1 *	0	Circuit pack or Media Module removed or SAKI Sanity Test (#53)	MINOR	ON	
18 *	0	**busyout board** <*address*>	WARNING	OFF	**release board** <*address*>
23 *	0	None	WARNING	OFF	
36 *	4368	none			
125 *		None	MINOR	ON	
217 *	0	None	WARNING	ON	
257	65535	Control Channel Test (#52)	MINOR	ON	**test board** <*address*> **sh r 20**
257 *					
267 *	0	None	WARNING	ON	
513 *	Any	None	MINOR	ON	**test board** <*address*> **sh**
769 *	4358	None			
1025 *	4363	NPE Audit Test (#50)			**test board** <*address*> **l r 20**
1281 *		Ringing Application Test (#51)	MINOR	ON	**test board** <*address*> **r 2**
1538 *	Any	None	WARNING MINOR	ON	
1793 *		Neon Test (#220)	MINOR	ON	**test board** <*address*> **r 2**
3840 *	Any	None			
3999 *	Any	None			

1 Run the short test sequence first. If every test passes, run the long test sequence. Refer to each appropriate test's description, and follow its recommended procedures.

Additional Information:

Error type 1: This error indicates the circuit pack or media module stopped functioning or has been physically removed from the system. This error type does not apply to ANN-BD, DETR-BD, S-SYN-BD, M/T-BD, or CLSFY-BD. The alarm is logged approximately 11 minutes after removal of the circuit pack or failure of the SAKI Sanity Test (#53).

Check for the physical presence of the circuit pack or media module in the slot indicated by the alarm. If the circuit pack or media module is absent, insert one of the proper type. If the circuit pack or media module is present and its red LED is lit, see LED alarms without Alarm Log entry or with Error Type 1 on page 27.

Error Type 18: This error indicates the circuit pack or media module has been busied out. Release the circuit pack or media module via **release board <*address*>**.

Error Type 23: The circuit pack or media module has been logically administered but not physically installed. The alarm should clear when the circuit pact or media module is installed.

If the circuit pack or media module is already installed:

1. Run **test board <*address*> long** and look at any test failures or error codes generated.
2. If the test does not clear error 23, then execute **reset board <*address*>** and run the long test again.
3. If the reset/test does not clear error 23, replace the circuit pack or media module.

Error Type 36: This error applies only to the Maintenance/Test circuit pack (TN771B or TN771C). The error indicates that the hardware associated with the Analog Trunk Testing port of the circuit pack failed to initialize. Note that when this error occurs, the Maintenance/Test circuit pack may report an invalid vintage. Although this error is not service-affecting, the Maintenance/Test circuit pack should be replaced.

Error Type 125: The circuit pack or media module physically installed in the slot does not match the type that is administered for that slot. Do one of the following:

- Remove the incorrect circuit pack or media module and replace it with one of the type that is administered for that slot.
- Use **change circuit-pack** or **change media-module** to readminister the slot so that it matches the board that is installed, and follow with **reset board <*address*>**.

Error Type 217: This error applies to the Maintenance/Test circuit pack (TN771D), Tone Detector (TN748B, TN748C, or TN748D), and Call Classifier (TN748) circuit packs. For the Maintenance/Test circuit pack, the error indicates that there is more than one Maintenance/Test circuit pack in the port network. For the Tone Detector or Call Classifier packs, the error indicates that there are more than 10 circuit packs in the system. Remove the circuit pack against which the error is logged.

Error Type 257: S8100: Aux Data - Any: This error indicates transient communication problems with this circuit pack. This error is not service-affecting and no action is required.

Error Type 267: This error indicates transient communication problems with this circuit pack or media module. This error is not service-affecting and no action is required.

S8100: The circuit pack or media module physically installed in the slot does not match the type that is administered for that slot. Do one of the following:

- Remove the incorrect circuit pack or media module and replace it with one of the type that is administered for that slot.

Use **change circuit-pack** or **change media-module** to readminister the slot so that it matches the board that is installed, and follow with **reset board <*address*>**.

Error Type 513: This error, when reported with Aux data in the range of 4352 to 4358, indicates that the circuit pack or media module has reported an on-board hardware failure. The circuit pack or media module will continuously test the hardware and report the results approximately every 10 minutes. If the hardware problem is resolved, the “leaky bucket” strategy should clear the alarm in approximately 30 minutes. However, if the alarm does NOT clear in 30 minutes, then the circuit pack or media module should be replaced.

Error Type 769: This error can be ignored, but look for other errors on this circuit pack or media module.

Error Type 1025: This error is not service-affecting and no action is required.

Error Type 1281: This error indicates that no ringing current is detected. Run Test #51, Ringing Application Test, and follow the procedures for Test #51. **S8100**: This error is only applicable to Analog Line circuit packs. **G700**: On the G700, the associated test for this error type aborts with Error Code 1412.

Error Type 1538: The hyperactive circuit pack or media module is out-of-service and may exhibit one or more of the following symptoms:

1. The common circuit pack/media module level tests such as Test #51 and/or Test #220 are aborting with error code 2000.
2. The tests run on the ports of this circuit pack or media module are returning with a NO-BOARD.
3. A busyout/release of the circuit pack or media module has no effect on test results.
4. A **list configuration** command shows that the circuit pack or media module and ports are properly installed.

If the XXX-BD is not a TN754 Digital Line Circuit Pack (DIG-BD) or Digital Line Media Module, and if this error happens again within 15 minutes, then replace the circuit pack or media module. If the XXX-BD is a TN754 Digital Line Circuit Pack (DIG-BD) or Digital Line Media Module, then check the alarm level. If the alarm level is a WARNING, this indicates that users are probably causing the hyperactivity by adjusting or changing their digital stations. If the circuit pack or media module is very hyperactive, then this alarm will be upgraded to a MINOR alarm within 1 hour. If the alarm level is a MINOR alarm, then replace the circuit pack or media module.

Error Type 1793: This error indicates that no neon current is detected. Run **test board <*address*> short** and follow the procedures for Test #220. This error applies to TN769 and TN746 Analog Line circuit packs and to MM711 Analog Line Media Modules.

Error Type 3840: This error is not service-affecting and no action is required.

Error Type 3999: This error indicates that the circuit pack or media module sent a large number of control channel messages to the switch within a short period of time. If Error Type 1538 is also present, then the circuit pack or media module was taken out-of-service due to hyperactivity. If Error Type 1538 is absent, then the circuit pack or media module was not taken out-of-service, but it has generated 50% of the messages necessary to be considered hyperactive. This may be completely normal during heavy traffic periods. However, if this error type is logged when the circuit pack or media module is being lightly used, it may indicate a problem with the circuit pack or media module, or the equipment attached to it.

System Technician-Demand Tests: Descriptions and Error Codes

Investigate tests in the order listed below when inspecting errors in the system. By clearing error codes associated with the *NPE Audit* test (#50), you may also clear errors generated from other tests in the testing sequence.

Order of Investigation	Short Test Sequence	Long Test Sequence	Reset Board Sequence	D/ND[1]
NPE Audit test (#50) **G700**: On the G700/G350, this test aborts with Error Code 1412.		X		ND
Ringing Application test (#51) **Note:** This test is applicable to TN746 and TN769 Analog Line circuit packs. **G700**: On the G700/G350, this test aborts with Error Code 1412.	X	X		ND
Control Channel Loop-Around test (#52)	X	X		ND
SAKI Sanity test (#53) **Note:** The SAKI Sanity test is run in the long test sequence for the Tone-Clock circuit packs (TN768, TN780) **only**. The test is run on other circuit packs or media modules only when they are reset via **reset board <*address*>**.		X	D	
Neon test (#220) **Note:** This test is applicable to TN746 and TN769 Analog Line circuit packs. **G700**: On the G700/G350, this test aborts with Error Code 1412.	X	X		ND

1 D = Destructive; ND = Nondestructive

NPE Audit Test (#50)

NOTE:
G700: On the G700/G350, this test aborts with Error Code 1412.

The system sends a message to the on-board microprocessor to update the network connectivity translation for every NPE (Network Processing Element) on the circuit pack.

Table 900: Test #50 NPE Audit Test

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available.
1019	ABORT	Test already in progress.
G700: 1412	ABORT	This test does not execute on a G700 Media Gateway.
	FAIL	Internal system error **1** Retry the command at 1-minute intervals up to 5 times.
	PASS	The circuit pack's NPEs have been updated with their translation.

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Table 900: Test #50 NPE Audit Test

Error Code	Test Result	Description / Recommendation
	EXTRA BD	Certain circuit packs have limitations on how many circuit packs can be in the system or port network such as the Maintenance/Test circuit pack (TN771B or TN771C), the Tone Detector circuit pack (TN748B, TN748C or TN748D) and the Call Classifier (TN744). The Maintenance/Test circuit pack allows only one circuit pack per port network. The Tone Detector and Call Classifier allow only 10 circuit packs in each system. All additional circuit packs will return EXTRA-BD and should be removed.
Any	NO BOARD	This is normal if the test is being done when: (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals up to 5 times.

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Ringing Application Test (#51)

This test checks the ringing application circuitry common to every port on an Analog Line circuit pack.

Table 901: Test #51 Ringing Application Circuit Test

Error Code	Test Result	Description / Recommendation
	ABORT	Internal system error. Could not allocate the necessary system resources to run test. The circuit pack is not installed.
1000 2100	ABORT	Could not allocate the necessary system resources to run test.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port <*address*>** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. (Refer to Chapter 8, for a full description of all possible states). Wait until the port is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times.

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Table 901: Test #51 Ringing Application Circuit Test

Error Code	Test Result	Description / Recommendation
1008	ABORT	Could not allocate a ringing circuit for one of the following reasons: all the ringing circuits are in use; the ringing generator is defective; ringing generator is not wired correctly. **1** If the test continues to abort, look for RING-GEN error in Error Log. **a** If there are RING-GEN errors, see RING-GEN (Analog Ring Generator) on page 1587 and try to resolve any problem(s). Then, go to step 2. **b** If there are no RING-GEN errors, and the test continues to abort, issue **test board <*address*>** on other TN742, TN769, or TN746 Analog circuit packs. If an ABORT with error code 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or may not be wired properly. See RING-GEN (Analog Ring Generator) on page 1587 maintenance documentation for details. If an ABORT with error code 1008 does NOT occur on the other ports, then all four ring generators are in use. Exit from this documentation. **2** Retry the command.
G700: 1412	ABORT	**G700**: On the G700, this test aborts with Error Code 1412.
2000	ABORT	There was no response from the board. **1** If error type 1538 (hyperactivity) is present in the error log, follow the maintenance strategy that is recommended for this error type. **2** Run **busyout board <*address*>**, **reset board <*address*>**, and **release board <*address*>**, and retest. **3** If the test still aborts, dispatch with the circuit pack. **4** Check the off-board wiring and the terminal, and, if there are no problems found, replace the circuit pack.
	FAIL	No ringing current is detected. The ringing application circuitry on this circuit pack probably is not healthy. **1** Retry the command again. **2** If the test continues to fail, look for RING-GEN error in Error Log. **a** If there are RING-GEN errors, see RING-GEN (Analog Ring Generator) on page 1587 and try to resolve any problem(s). **b** If there are no RING-GEN errors, then replace the circuit pack. **3** Retry the command again.

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Table 901: Test #51 Ringing Application Circuit Test

Error Code	Test Result	Description / Recommendation
	PASS	Ringing current is detected or this vintage of the Analog Line circuit pack does not support the Ringing Application Circuit Test. Analog Line circuit packs that DO NOT support Test #51 include TN712 Vintage 13 and earlier and TN742 Vintage 3 and earlier.
Any	NO BOARD	This is normal if the test is being done when (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals up to 5 times.

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Control Channel Loop-Around Test (#52)

This test queries the circuit pack or media module for its code and vintage, and verifies its records.

Table 902: Test #52 Control Channel Loop-Around Test

Error Code	Test Result	Description / Recommendation
None 2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
	FAIL	The test failed because the circuit pack or media module failed to return the code or vintage. **1** Retry the command up to 5 times. **2** If the test still fails, issue **busyout board <*address*>**, **reset board <*address*>**, and **release board <*address*>**, and then retest. **3** If the problem continues, replace the circuit pack or media module. **4** Run the test again.
	PASS	Communication with this circuit pack or media module is successful.
The next test result is for systems supporting circuit packs only.		
S8700 / **S8500**	EXTRA BD	This result should only appear when more than one TN771D Maintenance/Test circuit pack has been installed in this port network. Remove this circuit pack.
S8700 / **S8500** / **S8100**: Any	NO BOARD	This is normal if the test is being done when (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals up to 5 times.

SAKI Sanity Test (#53)

This test is **destructive**.

This test resets the circuit pack or media module. It is executed as part of the long test sequence only for the Tone-Clock circuit pack and DS1 interface circuit packs, and for the MM710 DS1 Interface Media Module. Other common circuit packs and media modules can be reset with the **reset board** <***address***> command which also executes this test.

Table 903: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
None	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1005	ABORT	**S8700 / S8500 / S8100**: Wrong circuit pack configuration to run this test. This error applies only to DS1 interface circuit packs. It means the DS1 interface circuit pack is providing timing for the system and, therefore, it cannot be reset without major system disruptions. **1** If the circuit pack needs to be reset, then set synchronization to another DS1 interface circuit pack or the Tone-Clock circuit pack and try again. See SYNC (Port-Network Synchronization) on page 1751. **G700**: If this is a G700 media gateway system, and the MM710 DS1 interface Media Module under test is providing timing for the platform, it cannot be reset without major platform disruptions **Note:** For this type of system the sync timing source is local to the G700. **1** If the MM710 Media Module needs to be reset, then set the synchronization timing source to another MM710 DS1 interface Media Module located in the same G700 and retest. See Setting G700 synchronization in *Maintenance Procedures (555-245-103)*.
1015	ABORT	Port is not out-of-service. **1** Busy out the circuit pack or media module. **2** Execute command again.
2100	ABORT	System resources required for this test are not available. **1** Retry the command at 1-minute intervals up to 5 times.
1	FAIL	The circuit pack or media module failed to reset.
2	FAIL	The circuit pack or media module failed to restart. **1** Execute command again. **2** If the problem persists, replace the circuit pack or media module.

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Table 903: Test #53 SAKI Sanity Test

Error Code	Test Result	Description / Recommendation
	PASS	The circuit pack or media module initializes correctly. **1** Run the short test sequence.
Any	NO BOARD	This is normal if the test is being done when (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals up to 5 times.

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Neon Test (#220)

This test checks the voltage required to light the neon lamp on an analog terminal. A relay connects a 150V DC source (**S8100**: 120V DC source) from the backplane of the circuit pack onto the voltage bus, and another relay connects a 2K shunt from the bus to ground. Current in the line is then monitored to determine if the voltage is present.

The neon test runs only for TN746 and TN769 Analog circuit packs and for the MM711 Analog Line Media Module. If the circuit pack is not a TN746 or TN769, the test will return PASS, but the test is not actually run.

Table 904: Test #220 Neon Test

Error Code	Test Result	Description / Recommendation
	ABORT	Cannot get the list of translated ports on the circuit pack.
1004	ABORT	The port was seized by a valid call during the test. The test has been aborted. **1** Use **display port <*address*>** to determine the station extension. Use **status station** to determine the service state of the port. If the service state indicates that the port is in use, then the port is unavailable for certain tests. Wait until the port is idle before retesting. **2** Retry the command at 1-minute intervals up to 5 times.
1008	ABORT	Could not allocate a ringing circuit. Either all the ringing circuits are in use, or the ringing generator is defective or is not wired correctly. **1** Retry the command at 1-minute intervals up to 5 times. **2** If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective or is not wired correctly (see errors for RING-GEN). If it does not occur on port test 48 for ANL-16-L, then all four ring phases are in use.

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Table 904: Test #220 Neon Test

Error Code	Test Result	Description / Recommendation
S8100: 1018	ABORT	There are not any translated ports on the circuit pack, or if there are ports, then none are administered to have "neon." **1** Verify that there are ports administered on the circuit pack. If no ports are administered, no further action is required. **2** Verify that you have neon sets connected (Avaya sets that may be neon sets are 500 and 2500 series, also some non-Avaya may also be neon sets). If no neon sets are connected to the circuit pack, the test continues to abort, but no further action is required. **3** If there are no neon sets connected to the circuit pack, at least one port needs to be translated with neon. To check if a port is translated with neon, use the **display port PCSSpp** command to determine the station extension of any station on this circuit pack. Use the **display station <extension>** to determine if the port is administered with neon. The field "Message Waiting Indicator:" must be set to "neon" for at least one of the administered ports. If this field is not administered to "neon" the test continues to abort. This is acceptable because not all stations have neon lamps on their analog terminals. If none of the terminals have neon lamps, the test continues to abort, but no further action is required. **4** Retry the command again. **5** Retry the command at 1-minute intervals a maximum of 5 times. **6** If the test continues to abort, look for RING-GEN errors in the Error Log. If an ABORT 1008 occurs for this test on other circuit packs as well, then the ringing generator may be defective. If it does not occur on port test 48 for ANL-16-L, all four ring phases are in use. **7** Retry the command again.
G700: 1412	ABORT	This test does not execute on a G700 Media Gateway.
2000	ABORT	Response to the request was not received within the allowable time period.
2100	ABORT	Could not allocate the necessary system resources to run this test.
	ABORT	Could not allocate the necessary system resources to run this test. Internal system error. **1** If Error Type 1538 is present in the Error Log, follow the recommended maintenance strategy.

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Table 904: Test #220 Neon Test

Error Code	Test Result	Description / Recommendation
	FAIL	The test failed because no neon current was detected. **1** Determine if there is a TN755 or TN752 power unit circuit pack (**S8100**: 650A power supply) installed in the same carrier as the TN746 or TN769 analog line circuit pack that failed the test. Look for the failure of test 220 on other TN746 or TN769 circuit packs in the carrier. If test 220 fails on the other circuit packs, replace the TN755 or TN752 power unit circuit pack (**S8100**: 650A power supply). **2** Retry the command again. **3** If the test continues to fail, replace the circuit pack. **4** Retry the command again.
	PASS	This circuit pack is a TN746 or TN769 Analog Line circuit pack and the neon current is detected. If this test passes, it can also mean that this circuit pack is not a TN746 or TN769 Analog Line circuit pack.
Any	NO BOARD	This is normal if the test is being done when (a) the board is not physically in the system or (b) the system is booting up. Otherwise, there is some inconsistency between the physical configuration and the data kept in the system. **1** Verify that the board is physically in the system. **2** Verify that the system is not in a stage of booting up. **3** Retry the command at 1-minute intervals up to 5 times.

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