Smooth Operator Configuration Note

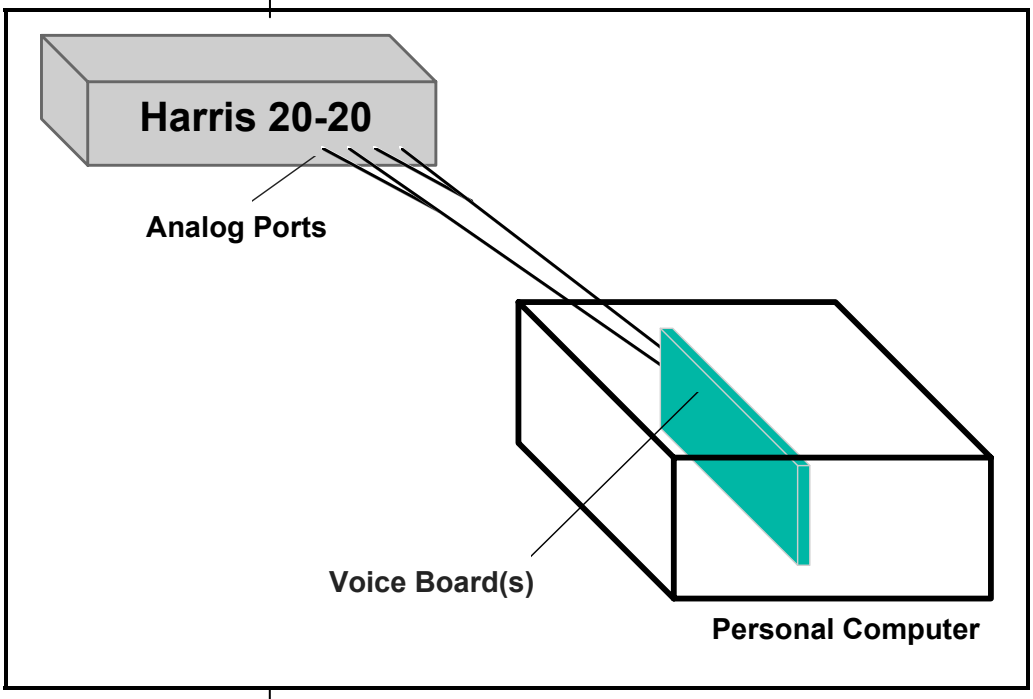
For Smooth Operator Family of Products

Octel
Voice
Processing
Module

Configuration Note 77075

Harris 20-20 Integrated Network Switch *

Revised 9/17/97



Inband signaling is used for integration

1.0 METHOD OF INTEGRATION

Inband. Smooth Operator Family of products can achieve call forward to personal greeting by DTMF signals passed from the Harris 20-20 with the call. Message waiting indicators are set and canceled by dialing a DTMF feature access code prefix and the subscriber's extension. A hookflash followed by the extension transfers the caller to the operator.

All references to Smooth Operator pertain to the entire family of products

2.0 SMOOTH OPERATOR ORDERING INFORMATION

There are many options available for both kit and turnkey versions of this product, depending on the application. Please consult with your sales representative.

PBX Hardware Requirements

3.0 PBX HARDWARE REQUIREMENTS

- One Harris 20-20 analog port per Smooth Operator port. The LUT card (764321) will provide 8 circuits per card and the HLUT card (764311) provides 16 circuits per card.
- DTMF Receivers (763303)
- One RJ-14 jack with 4-conductor line cord for every two Smooth Operator ports
- One analog line for remote service access
- One RJ-11 Jack for above and 2-conductor modular telephone cord.
- If FaxMail is installed.
  - One Harris 20-20 analog port per FAX port.
  - One RJ-11 Jack for every Brooktrout TR-112 fax port OR one RJ-14 Jack for every two Brooktrout TR-114 fax ports, along with 4-conductor modular telephone cord

PBX software requirements

3.1 PBX SOFTWARE REQUIREMENTS

- Minimum Software: Release 7.01 thru 10.
- Voice Mail Software
- Message Waiting

Supported integration features

4.0 SUPPORTED FEATURES

[✓] Items are supported

System Forward to Personal Greeting		**Message Waiting**	
All Calls	[ ]	LCD Display	[ ]
Ring/no answer	[✓]	LED	[ ]
Busy	[✓]	Lamp (Msg Waiting Key)	[✓]
Busy/No Answer	[ ]	Audible / Stutter Dial Tone	[✓]
Do Not Disturb	[ ]	**Multiple Return to Operator**	[✓]
Station Forward to Personal Greeting		**Direct Call**	[✓]
All Calls	[✓]	**Auto Attendant**	[✓]
Ring/no answer	[✓]	**Outcalling**	[✓]
Busy	[✓]	**Personal Greeting of Original-Called Party**	
Busy/No Answer	[✓]	Multiple Call Forward	[ ]
Do Not Disturb	[ ]	Double Call Forward	[✓]
Flexible Forwarding		Call Coverage	[ ]
Forward to No Answer Greeting	[✓]	**Intercom Paging**	[ ]
Forward to Busy Greeting	[✓]	**Supervised Transfers**	
Intercom/CO Forwarding	[ ]	Call Screening	[✓]
		Call Queuing	[✓]
		Intercom Paging	[✓]
		Record Telephone Conversation	[✓]

4.1 DISCONNECT TYPE

Positive disconnect is achieved by Drop in Loop Current. For proper external disconnect supervision, Ground start or Supervised Loop start CO lines are recommended.

5.0 CONFIGURING THE HARRIS 20-20

Programming PBX system parameters

Refer to the Harris 20-20 Installation Manual for information on entering, saving, and exiting database programming. Before you begin, we recommend that a hard copy of the customer database be completed using Harris 20-20 programming records to verify existing programming.

To configure the Harris 20-20 for call processing with Smooth Operator data must be entered into the following database tables:

Feature Class
Dial Control
Class of Service
Trunk Groups
Boards
Facilities
Route Patterns
Collect & Route
Extensions

Note: The following programming instruction assumes that at system startup the default settings are used. Programming for the Harris 20-20 is highly flexible and local requirement may not allow for the use of feature access codes. Codes used to access Smooth Operator should be adhered too.

Observe caution when using the database parameters shown in this note. They are not the same in all releases of Harris 20-20, e.g., F45 as HOLD will show up as F36 in another release and F45 will be PAGE. HOLD is required and PAGE is optional.

If problems with intermittent integration persist, then compare the following with site requirements. Not all administrative possibilities are shown. The scope of this document does not include discussing all features and their interactions.

5.1 HARRIS VOICE MAIL PROGRAMMING

Harris Voice Mail Programming

Harris Digital Telephone Systems has developed a special line-trunk group to utilize already established software tables when integrating with ONS trunks. Use the following steps to configure your PBX for this integration.

CREATE OR ADD FEATURE CLASS OF SERVICE AS SHOWN.

The Feature Class is a subset of the class of service. Smooth Operator will require its own Feature Class. When Class Type VMS-LINE is entered the default values will be assigned. During the edit session prompt's are not given for features that are either required or not applicable. Prompts are given for available optional features. Change only the following parameters as required:

(Example Feature Class)

FEATURE ADD 10	
Class Type	VMS-LINE
Extension dialing (F29)	REQUIRED
Hold (F45)	REQUIRED
Line disconnect (F48)	YES
Page (F55)	OPTIONAL
Supervised transfer (F87)	REQUIRED
Transfer by access code (F92)	REQUIRED
Trunk dialing	OPTIONAL
Unsupervised transfer (F94)	REQUIRED
VMS access (F95)	YES
VMS system (F96)	REQUIRED
VMS tone prompt (F96)	NO
Comment	VMS LINE COS

Feature Class is a subset of Class of Service and is required for programming a Class of Service for Facilities:

(Example Facilities)

FEATURE ADD 5	
Class Type	FACILITY
Answer Pretone (F2)	NO
Barge [rptectopm (F7)	NO
External Extension Treatment (F35)	YES
VMS tone prompt (F96)	NO
Comment	FACILITY CLASS

Check Feature Class for subscriber's extension Class of Service to ensure they include the following parameters:

(Example Station)

FEATURE EDT 2	
Feature Class	2
Class Type	STATION
External Extension Treatment (F29)	YES
VMS access (F95)	YES
VMS system (F96)	NO
VMS tone prompt (F96)	OPTIONAL
Comment	STATION COS

Note: For analog stations that do not have a message waiting light, assign VMS tone prompt (F96) as yes.

CREATE DIAL CONTROL CLASS SERVICE

Before programming Incoming and Outgoing class of service new Dial control classes of service are required.

(Example for VMS Trunk Group)

DIAL CONTROL ADD 11	
Dial control class	11
Dial control type	DIAL
Destination	CR-VMS /DT
Line intercept	TONE
Number intercept	TONE
Partial dial intercept	TONE
ATB intercept	TONE
Feature intercept	TONE
Control intercept	TONE
No dial intercept	TONE
Comment	DIAL CONTROL FOR VMS TRUNK GROUP

(Example COS for Facilities)

DIAL CONTROL LIST 1	
Dial control class	1
Dial control type	NO ORIGINATION
Destination	*** PREDEFINED ***
Line intercept	TONE
Number intercept	TONE
Partial dial intercept	TONE
ATB intercept	TONE
Feature intercept	TONE
Control intercept	TONE
No dial intercept	TONE
Comment	NO ORIGINATION POSSIBLE

ROUTING CLASS

In addition to a Dial control class of service, Incoming and Outgoing class of service require a routing class. Routing class define access to routing points and queue points of route patterns. They determine what routes will be available through Least Cost Routing. Normally Routing Class 1 is unrestricted and is the preferred Routing Class for Smooth Operator.

CONNECTION CLASS

Connection class is assigned in Incoming and Outgoing class of service. Connection class will define whether a connection is permitted between two ports. The connection class prompt in the class of service will not appear unless Department Security feature is purchased. Class 0 is unrestricted and is the preferred Routing Class for Smooth Operator.

CREATE NEW CLASS OF SERVICE.

Create a Class of Service (COS) for the Smooth Operator ports using the add class of service commands. Each class of service has five components:

dial control class; feature class; routing class, and reliable disconnect. The class of service of a trunk group determines what characteristic's apply to calls incoming on the trunk group.

(Example VMS Trunk Group)

COS ADD 12	
Class of service	12
Dial control class	11
Dial control type	DIAL
Feature Class	10
Routing Class	1
Connection Class	0
Reliable Disconnect	Y
Comment	VMS LINE COS

The class of service of a facility determines what characteristic's apply to calls outgoing on the trunk group used by the facility.

(Example Facility)

COS ADD 3	
Class of service	3
Dial control class	1 NO_ORIGINATION
Feature Class	5
Routing Class	1
Reliable Disconnect	Y
Comment	RELIABLE FACILITY CLASS

CONFIGURE TRUNK GROUP

Configure the line trunk group using the trunk command:

(Example VMS line Trunk Group)

TRUNK ADD 12	
Trunk group number	12
Trunk group type	LINE
Incoming class of service	12
Trunk ID digits	NONE
No answer extension	NONE
Call Flow	BOTH
Incoming start signaling	DIAL-TONE
Incoming dialing mode	MIXED
Outgoing start signaling	ANSWER
Outgoing dialing mode	DTMF
Search type	CIRCULAR FORWARD
Circuit Locations	02-03-01
	02-03-02
	02-03-03
	02-03-04
Unassigned circuit locations	4
AW display name	VMS
Teleset display name	VMS
Comment	RELIABLE FACILITY CLASS

PROGRAM FACILITIES

The facility's command is used to define what information will be passed to the Smooth Operator group. The following facilities are required:

- Direct Call - For Auto Station login.

(Example Direct Call)

FACILITY ADD 11	
Facility number	11
Trunk group number (DTMF)	12
Outgoing COS number	6
Outpulse command	SEND 2 SANI 3 SEND # WANSWER 1
Comment	MESSAGE RETREIEVAL MSG KEY + 1

- Operator Transfer to Password.

(Example for Transfer to Password)

FACILITY ADD 16	
Facility number	16 (example)
Trunk group number (DTMF)	12 (example)
Outgoing COS number	6 (example)
Outpulse command	SEND 2 SDIGITS 3 SEND # WANSWER 1
Comment	TRANSFER TO PASSWORD

- Secretary - returns System main Greeting.

(Example for Secretary)

FACILITY ADD 12	
Facility number	12
Trunk group number (DTMF)	12
Outgoing COS number	6
Outpulse command	SEND # WANSWER 1
Comment	VOICE KEY OF AWS ACCESS TO VMS

- Forward - Ring no answer

(Example for No Answer)

FACILITY ADD 13	
Facility number	13
Trunk group number (DTMF)	12
Outgoing COS number	6
Outpulse command	SEND 3 SDIGITS 3 SEND # WANSWER 1
Comment	FOR NO-ANSWER TO VMS

- Forward - ALL

(Example for Forward All)

FACILITY ADD 14	
Facility number	14
Trunk group number (DTMF)	12
Outgoing COS number	6
Outpulse command	SEND 6 SDIGITS 3 SEND # WANSWER 1
Comment	FORWARD ALL TO VMS

- Forward - Busy and Do not Disturb

(Example for Busy)

FACILITY ADD 16	
Facility number	15
Trunk group number (DTMF)	12
Outgoing COS number	6
Outpulse command	SEND 4 SDIGITS 3 SEND # WANSWER 1
Comment	BUSY/DO NOT DISTURB TO VMS

- Record Phone call

(Example for Record Phone Call)

FACILITY ADD 17	
Facility number	17
Trunk group number (DTMF)	12
Outgoing COS number	6
Outpulse command	SEND 5 SANI 3 SEND # WANSWER 1
Comment	RECORD PHONE CALL TO VMS

PROGRAMMING FOR ROUTE PATTERNS

Route patterns must be identified to tell the PBX what digits to send to Smooth Operator and the condition under which to send them.

- Call back to VMS with message indicator active (MSG key + digit 1):

(Example for Record Phone Call)

FACILITY ADD	
Route pattern name	VMS-GENERAL
Route pattern type	GENERAL
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	11 (example)
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	MESSAGE RETRIEVAL MSG KEY + 1

- Call to VMS for main system greeting:

(Example for VMS-Secretary)

FACILITY ADD	
Route pattern name	VMS-SECRETARY
Route pattern type	SECRETARY
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	12
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	DIRECT CALL WITH INITIAL GREETING

- Allows Station user with out a MSG key configured access to voice mail:

(Example for VMS-Direct)

	FACILITY ADD
Route pattern name	RP-VM-DIRECT
Route pattern type	STANDARD
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	11
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	STATION DIRECT CALL WITH NO MSG BUTTON

- Allow operator to transfer outside caller to their mail box for messages.

(Example for VMS-Password)

	FACILITY ADD
Route pattern name	RP-VM-PASSWORD
Route pattern type	STANDARD
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	16
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	OPERATOR TRANSFER TO PASSWORD

- Allow transfer of outside caller to a mail box to leave a message.

(Example for VMS-Transfer)

	FACILITY ADD
Route pattern name	RP-VMS-TRANSFER
Route pattern type	STANDARD
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	14
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	TRANSFER TO PERSONAL GREETING

- Allow transfer of outside caller to a mail box to leave a message.

(Example for VMS-Record)

	FACILITY ADD
Route pattern name	RP-VMS-RECORD
Route pattern type	STANDARD
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	17
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	CONFERENCE AND RECORD PHONE CALL

Auto answer route patterns are used when digit collection is not required to complete the call.

- Ring no answer.

(Example for No Answer)

FACILITY ADD	
Route pattern name	RP-VM-NO-ANSWER
Route pattern type	AUTO-ANSWER
Auto-Answer extension	1400
Directory entry - unpublished extension	
Name	RP-VM-NO-ANSWER
Extension	1400
Location	
Department	
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	13
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	OPERATOR TRANSFER TO PASSWORD

- Call forward all

(Example for Forward)

FACILITY ADD	
Route pattern name	RP-VM-FORWARD
Route pattern type	AUTO-ANSWER
Auto-Answer extension	1401
Directory entry - unpublished extension	
Name	VMS
Extension	1401
Location	
Department	
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	14
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE

Comment	FORWARD TO VMS ALL

- Call forward on Busy and Do not Disturb.

(Example for Forward/Do Not Disturb)

FACILITY ADD	
Route pattern name	RP-VM-BUSY
Route pattern type	AUTO-ANSWER
Auto-Answer extension	1402
Directory entry - unpublished extension	
Name	VMS-BUSY
Extension	1402
Location	
Department	
1. Point type	ROUTE
Routing classes	0-63
Forward routing classes	0-63
Facility	15
Days allowed	SAT-FRI
Hours allowed	0-23
Include route for queuing	Y
2 Point type	QUEUE
Routing classes	0-63
Forward routing classes	0-63
Queeing method	STANDBY (offhook)
Queuing Time	120 (sec)
Continuation pattern	NONE
Comment	FORWARD TO VMS ON BUSY/DND

CREATE THE ACCESS CODES REQUIRED FOR SMOOTH OPERATOR.

Create the access codes required for subscribers to direct dial the voice module and for transferring calls to the voice module using the VMS-General and VMS-Secretary route patterns. For example:

(Example Collect & Route)

COLLECT ADD CR-VMS			
Numbers to Collect	Option to Modify Collected Number	Destination	*(Remarks only not part of Entry)*
*9	/ACC2	=VMS-MSGS	*(for message-waiting set)*
#9	/ACC2	=VMS-NO-MSGS	*(message-waiting cancel)*
		The following are used starting with Rev. Level 10	
*9XXX	/ACC2	=VMS-MSGS-ACS	*(for message waiting set)*
#9XXX	/ACC2	=VMS-NO-MSGS-ACCS	*(message-waiting cancel)*
30	/ACC2	=RP-VM-SECRETARY	
31	/ACC2	=RP-VM-DIRECT	
32	/ACC2	=RP-VM-RECORD	
33XXX	/REM 1,2	=RP-VM-TRANSFER	
34XXX	/REM 1,2	=RP-VM-PASSWORD	
Comment		VMS DIALING INSTRUCTIONS	

CHANGE REDIRECTION GROUP AS REQUIRED.

Change the call Redirection group lists to reflect option of VMS system as follows:

(Example Call Redirection Group 1)

CRG EDT 1				
From EXT	Forward Type	Caller Type	To EXT	No-Answer Ring Cycles
				-
288	FWD-ON-BUSY	EXTERNAL	1402	-
288	FWD-NO-ANSWER	EXTERNAL	1400	4
288	FWD-ON-BUSY	INTERNAL	1402	-
288	FWD-NO-ANSWER	INTERNAL	1400	6
288	FWD-PRIVACY	INTERNAL	1402	-

6.0 SMOOTH OPERATOR PROGRAMMING

All references to Smooth Operator Pertain to the entire family of products

During the install process run the Integrator program and choose the Harris 20-20. The Integrator will place appropriate feature codes into the Smooth Operator Setup. The integrator should insert the following codes. Default values for these parameters assume three digit extensions.

Outside Line Access Code	**9,**
Off Hook Delay (OFFHDLY)	**15**
Hook Flash Interval (FLINTVL)	**30**
DTMF Tone Length (TONELEN)	**8**
Transfer Parameters	
Custom Transfer Code	**&,XN,3**
Message Waiting Parameters	
Permit Message Waiting Lights	**Enable**
Message Waiting Light Prefix ON	***9**
Message Waiting Light Prefix OFF	**#9**
Inband Parameters	
Total Number of DID Digits	**4**
Seconds to Wait for DID	**1**
Location of Inband Signaling Code	**1**
Number of Milliseconds to Wait for Digits	**150**
Code for Go to Voice Mail	**6**
Start at End of String for Go to Voice Mail	**Enable**
Location of Mailbox Number for Go to Voice Mail	**3**
Code for Go to Immediate Record	**5**
Start at End of String for Go to Immediate Record	**Enable**
Location of Mailbox Number for Immediate Record	**3**

Code for Immediate Subscriber Login to Mailbox	**2**
Start at End of String for Immediate Login	**Enable**
Location of Mailbox Number for Immediate Login	**3**
Code for Busy Extension	**4**
Start at End of String for Busy Extension	**Enable**
Location of Mailbox Number for Busy Extension	**3**
Code for No Answer Extension	**3**
Start at End of String for No Answer Extension	**Enable**
Location of Mailbox for No Answer Extension	**3**
Start at End of String for Default Code	**Enable**
Location of Mailbox Number for Default Code	**3**

Note: Verify these dialing sequences for your PBX

6.1 SUPERVISED TRANSFERS - CALL ANALYSIS

Analysis Consideration Before Running Call

During the system installation the Call Analysis program will be run. This program can also be run from the C:\CVR prompt at any time Smooth Operator is not running by typing CCA. The purpose of Call Analysis is to analyze the various tones and cadences returned by the switch during a supervised transfer, thus enabling the Smooth Operator to monitor call progress. In addition the tables produced are for fax detection, release when the drop in loop current disconnect is missed and message delivery. Usually Call Analysis may be run without setting any special parameters. Call Analysis must be run in the manual mode to an extension that has been programmed with no forwarding. To run Call Analysis in the manual mode, type CCA at a C:\CVR prompt. Enter "0" (zero) in Channel In, and enter the phone number of the station you want Call Analysis to dial during its analysis.

Relocate a phone next to Smooth Operator for test. For example, extension 235 is not programmed to forward under any condition (this is the extension that Call Analysis will dial when you start the test). Enter 235 in the Phone Number field. Enter 0 (zero) into the "Channel In" field (this will tell Call Analysis to dial whatever is in the Phone Number field.

Call Analysis will prompt you to **not** answer the phone or make the phone busy as required.

Upon completion of Call Analysis you must again reboot the PC to allow for the tone table to take effect.

7.0 CONSIDERATIONS / ALTERNATIVES

The following items should be considered, below:

Important notes concerning this integration

- ☐ Unsupervised Transfers Preferred
- ☐ Supervised Transfer, Call Queuing and Paging
- ☐ Record Telephone Conversation

7.1 UNSUPERVISED TRANSFERS PREFERRED

Unsupervised Transfers Preferred

The Harris 20-20 has a complex and highly flexible call handling capability making unsupervised transfer the preferred method. The custom transfer string will support unsupervised transfers to busy stations without call forward programming. The custom transfer string will not support supervised transfer.

7.2 SUPERVISED TRANSFER, CALL QUEUING AND PAGING

Supervised Transfer, Call Queuing and Paging

If Supervised transfer is required, the custom transfer string must be removed and unsupervised will be treated on an individual basis.

Supervised Transfer, and Queuing require Subscribers to not program Call Forward Busy and Call Forward Busy / No Answer. Program Call Forward No Answer to go to the Smooth Operator extension. The Forward No Answer timer should be set higher than the Max Rings in the mailbox Class Of Service for both internal and external calls.

When Call Queuing is in use and CO lines do not provide disconnect supervision, enable the option, “Require Caller to Press Star to Stay in Queue," in the Smooth Operator Setup, Call Queuing Parameters. Unsupervised CO lines will cause the Subscriber to receive phantom calls because of callers who have decided not to wait in queue. This will alleviate the perception that the called subscriber is losing calls.

For subscriber who will receive unsupervised calls condition the mailbox Class Of Service by changing the Max Rings to zero and adding “,3” to the end of the extension number. This should be applied to all Attendant Workstation Mail Box’s.

7.3 RECORD TELEPHONE CONVERSATION

Record Telephone Conversation

When using the Record Telephone Conversation, you must be sure that the Message Time and Total Time in the Class of Service for the Mailbox is set high enough to record the conversation. This may also affect total storage time on the system.

To record telephone conversation the subscriber would press the conference key, (or hook-flash and enter conference access code) which puts the existing call on hold, they dial the access code for immediate record. Smooth Operator will return a tone at which time the subscriber can complete the

conference. The telephone conversation will be stored in the subscriber's mailbox and a message waiting indicator will be generated.

COMMUNICATIONS CORPORATION

Sarasota City Center
1819 Main Street, Suite 900
Sarasota, FL 34236
(941) 331-7500

(CFN 77075)