SX-100®/SX-200®
SUPERSWITCH®
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)
DOCUMENTATION INDEX

1. GENERAL

1.01 This Section lists MITEL Standard Practices which have been issued pertaining to the *SX-100®/SX-200®* Systems.

2. DOCUMENTATION INDEX

2.01 The complete set of Practices are contained in five volumes as listed in Table 2-1. Volume I basically covers the description and operation of the Systems. Volume II is concerned with the installation aspects of the systems. All installation forms are located in Volume III. All troubleshooting information is contained in Volume IV. Volume V describes Automatic Call Distribution and Associated Modem Line Feature.

TABLE 2-1
PRACTICE INDEX

VOLUME I	
Section No.	**Title**
MITL9105/9110-096-000-NA	Documentation Index
MITL9105/9110-096-100-NA	General Description
MITL9105/9110-096-105-NA	Features Description
MITL9105/9110-096-106-NA	*SUPERSET 3*™ Set
MITL9105/9110-096-107-NA	*SUPERSET 4*® Set
MITL9105/9110-096-150-NA	Ordering Information
MITL9105/9110-096-180-NA	Engineering Information
MITL9105/9110-096-212-NA	Multi-Digit Toll Control
MITL9105/9110-096-213-NA	Automatic Route Selection
MITL9105/9110-096-220-NA	Abbreviated Dialing
MITL9105/9110-096-223-NA	Uniform Call Distribution
MITL9105/9110-096-224-NA	Recorded Announcements
MITL9105/9110-096-226-NA	Automatic Number Identification
MITL9105/9110-096-315-NA	Console Description
MITL9105/9110-096-450-NA	Traffic Measurement
MITL9105/9110-096-451-NA	Station Message Detail Recording
MITL9105/9110-096-500-NA	General Maintenance Information
VOLUME II	
Section No.	**Title**
MITL9105/9110-096-000-NA	Documentation Index
MITL9105/9110-096-200-NA	Shipping, Receiving and Installation
MITL9105/9110-096-210-NA	System Programming
MITL9105/9110-096-215-NA	System Test Procedures
VOLUME III	
Section No.	**Title**
	Installation Forms
VOLUME IV	
Section No.	**Title**
MITL9105/9110-096-350-NA	Troubleshooting
VOLUME V	
Section No.	**Title**
MITL9105/9110-096-005-NA	Documentation Index
MITL9105/9110-096-222-NA	Generic 217 Automatic Call Distribution
MITL9105/9110-096-224-NA	Recorded Announcements
MITL9105/9110-096-227-NA	Associated Modem Line Feature

SX-100®/SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION

NOTICE

CONTENTS PAGE

LIST OF ILLUSTRATIONS

1. INTRODUCTION

General

1.01 Automatic Call Distribution (ACD) is a feature within the *SX-100®/SX-200®* Private Automatic Branch Exchange (PABX) that switches a large volume of similar incoming trunk traffic directly to a selected group of extensions (Agents), distributing the calls equitably among the Agents. Typical examples include: a telephone order desk for a department store, a customer service department of a telephone, utility, or cable TV company, or an airline reservations office. When there are more incoming calls than available Agents, ACD provides a recording to advise that all Agents are busy, and that an Agent will answer the call as soon as possible. ACD connects the caller who has been waiting the longest time to the first Agent who becomes available. One trunk group, usually incoming long distance, may be given priority when being assigned to an Agent. In addition to the ACD operation, other telephones within the system that have not been assigned as an ACD agent extension, will have regular PABX software package features.

Reason for Reissue

1.02 This Section has been reissued to describe the Automatic Call Distribution feature of the *SX-100/SX-200* PABX.

2. ACD SYSTEM FEATURES

General Description

2.01 ACD provides a method of directing a number of incoming trunks to Agent Groups or Recording Groups. ACD connects the incoming trunk call which has been waiting the longest time to the next Agent who becomes available. The PABX can provide messages to a caller who does not access an Agent immediately. ACD distributes calls equitably to all Agents. A Supervisor may reprogram system parameters, as required.

Agent Groups

2.02 All *SUPERSET 4*® sets that handle incoming ACD traffic are programmed into Agent Groups during Standard Programming; their users are referred to as Agents. Agent Groups are similar to Hunt Groups when programmed.

Agents

2.03 Extensions that are programmed into Agent Groups during Standard Programming are referred to as Agents, and have the following characteristics:

- A maximum of 63 Agent ID codes are available.
- A maximum of 30 active logged-in Agents may be talking to trunks at once. If a 31st Agent attempts to log on, the message NO ACCESS will appear in the *SUPERSET 4* set display.
- Calls are allocated to Agents based upon previous workload to ensure an equal distribution.
- A predetermined work time to complete paper work can be made available to all Agents in the same Agent Group.
- Active Agent positions can be taken out of service momentarily by using the Do Not Disturb feature.
- Agents can signal the supervisor when help is required with or without the caller being aware.
- Agents can use a *SUPERSET 4* set for Account Code entry. The Account Code can also be made System verifiable if required.
- Agents have an ID code and can move between Agent positions by logging in and out.

2.04 Since calls within each group are of a similar nature, all Agents within an Agent Group are trained and equipped to provide the information or service a caller may request. Each Agent uses a *SUPERSET 4* telephone set. The Supervisor assigns each Agent an ID code

(ranging from 01 to 63) to use when logging on and off to the Agent Group.

To log on:	To log off:
Dial ACD Agent Access Code	Dial ACD Agent Access Code
Dial Agent ID code	Dial 00
Press HANG-UP softkey	Press HANG-UP softkey

2.05 A specified work time is allocated for completion of paper work at the end of each call handled (After Call Work Time). If more time is required, the Agent can use Do Not Disturb to inhibit calls being routed to that position.

2.06 An Agent, if talking or off-hook, has the HELP prompt active on the *SUPERSET 4* set, and may request assistance from the Supervisor by pressing the HELP softkey which sends the following minor alarm to the console:

E101 NNN where:	NNN is the Agent equipment number
XXXXHELP	XXXX is the Agent extension number.

Supervisor

2.07 One or two Supervisors can provide Supervisor functions for the PABX. The following lists features for ACD Supervisor operation:

- examining the current status of an Agent Group.
- recording messages onto a MITEL Recorded Announcement Card (RAC).
- specifying the playback duration (in seconds) of recorded announcements.
- monitoring the Mean Abort Time (MAT); the MAT is calculated by the system using the times of the last four calls that were aborted.
- monitoring the number of active Agents.
- monitoring the number of calls waiting for all Agent Groups. The Calls Waiting field on the console indicates the number of calls (up to nine) waiting to access a group. When a call rings in the Calls Waiting field is overwritten and the appropriate LED flashes (Dial 0, LDN, etc.).
- monitoring an Agent's conversation without any audio intrusion by using the FLASH key programmed as the MONITOR key. Since this form of override provides no form of intrusion tone, the caller will not be aware that additional persons are monitoring the conversation. Consult local authorities for legalities before enabling this key.

- monitoring the Mean Time to Answer (MTTA); the MTTA is calculated by the system using the times taken to answer the last four calls to that group.

2.08 When the MTTA exceeds the specified maximum for an Agent Group, the console immediately displays the following minor alarm:

E100 NNN where: NNN is the Agent Group number (1-12)
XXXX or XXXX is the Agent Group Access Code

2.09 The Supervisor can then add more agents to the group, or let the programmed overflow mechanism operate. If the overflow route is to a Recording Group, the incoming trunk will be dropped immediately after the recorded announcement is heard by the caller. When the MTTA returns to below the maximum, regular sequential recorded announcement playbacks will resume.

Recorded Announcements

2.10 The *SX-100/SX-200* software package supports recorded announcements, which may be used by the PABX for several different and unrelated functions. Three of these functions are: ACD messages, Wake-up messages, and Intercept messages. Refer to Section MITL9105/9110-096-224-NA for a detailed description of how Recorded Announcements are to be used with this PABX.

2.11 The console is used to link the Recording Groups to the Agent Groups. Up to four different recorded announcements can be given to an unserviced trunk calling each Agent Group. Each announcement is specified by a Recording Group and a time delay as programmed by the Supervisor. The time delay is the time the trunk must wait before hearing the recorded announcement, either from when the System answered it (first announcement) or from when it was disconnected from the previous message (last three announcements). A time delay must be given for the first announcement, but is optional for the last three. If a delay is not specified, the system determines a single delay time for the remaining announcements, so that they are equally-spaced and all heard, given the current MTTA.

2.12 When a recorded announcement is required for an incoming trunk, the specified Recording Group is scanned, and an idle recording device is activated. If an Agent becomes free while a trunk is connected to a recorded announcement, the PABX immediately connects the caller to the Agent.

2.13 The number of RACs and RADs used is limited only by the peripheral slots available in the PABX configuration.

2.14 Each Recording Group provides one message, but can have more than one recorded announcement, each with the same message. This way, incoming calls do not have to queue for a message during heavy traffic conditions.

2.15 Recorded Announcement Card (RAC) - This card occupies one peripheral slot in the system and provides two separate 8-second messages using digital solid-state storage. Messages are recorded from the Supervisor's position, and stored as a non-volatile digital recording. The card is not subject to routine maintenance or tape breakage as are most commercial tape recording units.

2.16 Recorded Announcement Device (RAD) - These customer-provided non-MITEL devices connect to the system through a tip-ring pair of a line circuit. The equipment number is rung as a telephone set is rung; when the RAD answers, the system connects it to the incoming trunk, and times the duration that it is connected. At the end of the programmed duration, the system disconnects the trunk from the device port, and waits for the RAD to go back on-hook.

2.17 Up to 12 Recording Groups are available. Each Group may provide a different message. Under heavy traffic conditions it may be desirable to have more than one recording unit with the same recording in each Recording Group. This is done to avoid having incoming calls queue for a recording.

Incoming Trunks

2.18 Incoming trunks may be handled more efficiently by using the following features:

- Automatic 2-level priority selection - while waiting for service from an Agent Group, an incoming trunk in Trunk Group 12 has priority; this group should include INWATS, foreign exchange, and tie trunks.

- One or more trunk groups can be directed to the same Agent Group, but one trunk group cannot be directed to more than one Agent Group.

- If the MTTA exceeds a selected maximum for an Agent Group, all incoming trunks can be automatically diverted to an overflow route - special Recording Group, Agent Group, extension, or Supervisor.

- For proper operation, ACD trunks must be Ground Start, and be able to recognize and disconnect abandoned calls. Otherwise, the calls will remain queued, and eventually have to be answered, causing unnecessary workload.

3. ACD PROGRAMMING AND ASSIGNMENTS

Enabling ACD

3.01 ACD is a programmable option with the *SX-100/SX-200* PABX. If ACD is enabled, standard and extended programming forms must be completed to activate its features. Note that Supervisor Function Codes determine a substantial portion of ACD operation.

Standard Programming

3.02 During Standard Programming, the following Features and Options must be enabled for ACD operation:

- System Option 251 (ACD Enable)
- COS Option 49 (Station Conference)
- COS Option 117 (ACD Agent)
- System Feature Access Code 18 (Supervisor Access Code) must be programmed (usually *).
- System Feature Access Code 49 (ACD Agent Access Code) must have an Access Code defined so that Agents may log in and out.
- System Option 103 (Supervisor Busy Override) must be enabled to allow the Supervisor to override a conversation.
- The relevant Traffic Measurement System Options must be enabled (refer to Section MITL9105/9110-096-450-NA).
- The relevant Station Message Detail Recording Options must be enabled (refer to Section MITL9105/9110-096-451-NA).
- A RAD may be connected only to a standard line card.
- System Option 230 (Account Code Enable) and other Options for the desired Account Code operation must be set if Account Codes are to be used.
- To enable the Supervisor to override an Agent with no audio intrusion System Option 131 must be enabled to have the console FLASH key converted to an OVERRIDE key. System Option 103 (Attendant Busy Override) must also be enabled. Note that System Option 131 conflicts with 121 (Serial Call Override Flash key).
- SMDR must be enabled to run on incoming trunks. Also, all ACD trunks must be programmed as DIL to the Agent Groups intended to serve them.

3.03 Agent Class of Service - Each Agent must have Option 117 (Call Distribution Agent Position) enabled in its Class of Service; if Account Codes are to be used, COS Option 56 (Account Code Access) must also be enabled.

Hunt Groups

3.04 Up to 12 hunt groups are available on the PABX. Hunt groups are programmed during Standard Programming of the system, and include Agent Groups, Trunk Hunt Groups, and Recording Groups. The Supervisor may reprogram hunt groups as required. The total collective assignment of Hunt Groups cannot exceed 12.

Agent Groups

3.05 Agents must be programmed into one or more Agent Groups (Hunt Group). All Agents who service the same type of calls must be in the same Agent Group, which is assigned its own Access Code.

Supervisor Functions

3.06 The Supervisor specifies the ACD parameters by dialing from the Supervisor Console using Supervisor Function Codes. All Standard Programming must be completed before using the Supervisor codes.

To Specify Maximum MTTA and Overflow Code

Dial *246
Dial Agent Group Access Code
Dial maximum time to answer, in seconds (000-255)
Dial Overflow Access Code (Agent/Recording Group, Supervisor)
Dial * to enter another Agent Group number or press the RELEASE key.

The console displays:

SOURCE XXXX TTT
DEST YYYY

where: XXXX - Agent Group Access Code
TTT - maximum time to answer (MTTA 000-255 s)
YYYY - Overflow Access Code (Agent Group, Recording Group, station, or Supervisor)

To Display Current MTTA and Overflow Code

Dial ⁎246
Dial Agent Group Access Code
Dial #
Press RELEASE key to terminate display.

The console displays:

SOURCE XXXX TTT where: XXXX - Agent Group Access Code
DEST YYYY TTT - maximum time to answer (MTTA 000–255 s)
YYYY - Overflow Access Code (Agent Group, Recording Group, extension, or Supervisor)

To Specify After-call Work Time

Dial ⁎245
Dial Agent Group Access Code
Dial work time, in 2-digit seconds (00–99)
Dial ⁎ to enter another Agent Group number, or
Press RELEASE key when finished.

The console displays:

SOURCE XXXX TT where: XXXX - Agent Group Access Code
TT - current work time (00–99 s)

To Specify Recordings and Delay Times

Dial ⁎243
Dial Agent Group Access Code
Dial choice number (1–4) (Choice 1 must be programmed)
Dial Access Code
Dial time delay, in 2-digit seconds (00–99 where 00 = automatic)
Dial ⁎ to enter another choice number, or
Press RELEASE key.

The console displays:

SOURCE XXXX Z where: XXXX - Agent Group Access Code
DEST YYYY TT Z - Recording number of the Agent Group
YYYY - access code (Recording Group, Agent Group,

extension, or Supervisor)
TT - delay time (00-99 s)

To Review Recording and Delay Time Assignments

Dial ⁎244
Dial Agent Group Access Code
Dial Recording number (1-4)
Dial ⁎ to review another recording assignment, or
Press RELEASE key to terminate

The console displays:

SOURCE XXXX Z
DEST YYYY TT

where:
XXXX - Agent Group Access Code
Z - Recording number of the Agent Group
YYYY - access code (Recording Group, Agent Group, extension, or Supervisor)
TT - delay time (00-99 s)

To Delete All Data Associated With an Agent Group

Dial ⁎243
Dial Agent Group Access Code
Dial #
Press RELEASE key to terminate.

To Examine Current Status of an Agent Group

Dial ⁎247
Dial Agent Group Access Code
Press RELEASE key to terminate.

The console displays:

SOURCE XXXX ZZ
DEST TTT AAA

where:
XXXX - Agent Group Access Code
ZZ - number of active Agents in the group
TTT - Mean Time to Answer (000-255 s based on last four calls answered)
AAA - Mean Abort Time (000-255 s based on last four calls aborted)

3.07 The Calls Waiting field on the console will indicate the number of calls waiting for a group up to a maximum of 9. Should a call ring in to the console, the Calls Waiting field will be overwritten and the appropriate LED will flash (Dial 0, LDN etc.). The MTTA is calculated using the time taken to answer the last four calls to that group. Similarly, the mean abort time is calculated using the times of the last four calls that were aborted by the caller. When the MTTA exceeds the specified maximum for an Agent Group, the Supervisor is immediately notified by a minor alarm. The format of the alarm is:

E100 NNN where: NNN is the Agent Group number (1-12)
XXXX or XXXX is the Agent Group Access Code.

3.08 If an Agent requires assistance from the Supervisor and presses the HELP Key on the *SUPERSET*®, a minor alarm is generated:

E101 NNN where: NNN is the Agent equipment number
XXXXHELP XXXX is the Agent extension number.

Override/Monitor

3.09 If the Supervisor wishes to participate in an Agent's conversation, the Supervisor need only dial the Agent's extension number, and then press the OVERRIDE key. While this key is held down, the Supervisor may talk to the Agent and the caller. A barge-in tone is heard by all parties when the Supervisor overrides.

3.10 If the Supervisor wishes to monitor the Agent's conversation without any intrusion tones the Supervisor may do so by dialing the Agent's extension number, and then pressing the MONITOR key that the programmer substituted for the FLASH key. While this key is held down, the Supervisor may listen to the Agent and the caller (Note: to inhibit audio from the Supervisor, the console must have a special handset with a microphone switch). No tone is heard by the Agent or caller when the Supervisor is monitoring.

4. PROGRAMMING EXAMPLE

General

4.01 This data must be entered into the system from the console before recorded announcements can be used. Guidelines which apply to all recorded announcements are listed below.

- All RACs and RADs within one Recording Group must hold the same message.
- The length of the message in a recording group must be specified; it must not exceed 8 seconds if the group includes a RAC, but can be up to 99 seconds if the group contains only RAD(s).
- The supervisor accesses a Recording Group by the Group Access Code assigned when the group was created.
- Each module on a RAC can be in a different Recording Group.
- Four equipment numbers (of eight assigned to a card position) are assigned for each RAC, two for each module. All four equipment numbers must be assigned; otherwise, only the assigned channels are used.

module 1	record/playback channel 1	(card position equip num 2)
	playback channel 2	(card position equip num 4)
module 2	record/playback channel 3	(card position equip num 6)
	playback channel 4	(card position equip num 8)

- Messages on RACs are recorded from the console; messages on RADs are recorded according to manufacturer's instructions.
- A RAD is assigned to one equipment number (standard line circuit tip and ring).
- Each recording group must be identified with a unique access code. Each RAC or RAD must be assigned to a recording group (if necessary, a group of one member).

4.02 The following steps are an example of how an SX-100/SX-200 PABX with ACD software may be programmed to use Automatic Call Distribution and Recorded Announcements to distribute incoming traffic to a group of Agents. Figure 4-1 and Figure 4-2 are forms which have been completed to correspond with this example.

(a) Define and program agent extension class of service options, including COS Option 117, which must be enabled for ACD agent status. Refer to Section MITL9105/9110-096-210-NA, System Programming for a detailed description of system programming.

(b) Specify equipment numbers for equipped RADs into system; refer to RAC/RAD Programming form (refer to Figure 4-2).

Dial ⁎230
Dial RAD port equipment number
Dial ⁎to proceed to equipment number of next RAD
Dial RAD port equipment number
Repeat above two steps for further RAD port assignments
Press RELEASE when complete.

(c) Specify equipment numbers for equipped RACs into system; refer to RAC/RAD Programming form (refer to Figure 4-2).

Dial ⁎231
Dial equipment number for the first RAC record/playback channel (second equipment number of RAC slot)
Dial ⁎ to proceed to the next equipment number
Dial equipment number for the second RAC record/playback channel (sixth equipment number of RAC slot)
Repeat above two steps for further RAC assignments
Press RELEASE when complete

Dial ⁎232 to review assignments
Dial ⁎ to proceed to the next equipment number.

Note: The system automatically increments the record/playback channel equipment number by two to define the playback only channel of the same module.

(d) Define agent extensions, hunt groups, and recording groups on the HUNT GROUPS AGENT/RECORDING GROUPS form. Figure 4-1 shows a form completed with a typical PABX assignment, one terminal hunt group and four recording groups. A RAC is installed in slot 7; therefore its equipment numbers are 50, 52, 54, and 56. RADs are connected to the first two line circuits of slot 8; therefore their equipment numbers are 57 and 58.

(e) Put the Supervisor console into SYSTEM PROGRAMMING mode (refer to Section MITL9105/9110-096-210-NA) and program the data recorded on the Hunt Groups Agent/Recording Groups form into the system:

Press HUNT GROUP and enter hunt group number (1-12)
Press ACCESS CODE and enter access code
Press EQUIPMENT NUMBER and enter equipment number
Repeat above two steps for further equipment number entries
Press ENTER when complete
Repeat above four steps for each hunt group
Exit from PROGRAMMING mode.

Note: All agent/recording groups being used, including a group with onl one member, must be identified on the Hunt Groups Agent/Recording Groups form (Figure 4-1) and programmed into the PABX.

(f) Transfer the following data from the HUNT GROUPS AGENT/RECORDING GROUPS form (refer to Figure 4-1) to the RAC/RAD PROGRAMMING form (refer to Figure 4-2):
- Agent equipment numbers
- Hunt groups and access codes for each Agent group
- Equipment numbers for each equipped RAC
- Hunt groups and access codes for each RAC recording group
- Equipment numbers for each equipped RAD
- Hunt groups and access codes for each RAD recording group.

(g) Specify time durations onto the RAC/RAD Programming Form (see Figure 4-2):

Assign time in seconds (nn) to time delay choice 1
Assign all message lengths in seconds (nn) for each RAC or RAD
Assign time in seconds (nn) for each music on hold duration.

(h) Specify recorded message length times into system from Supervisor console (in normal operating mode, not programming mode).

Dial	⁎242
Dial	recording group access code
Dial	message length time in seconds (nn)
Press	RELEASE when complete
Repeat	above steps for all recording groups.

(i) Specify time delay and recording duration for choices 1-4. Note that it is not necessary to use four Recording Devices; one of the choices may be Supervisor, Agent, Agent Group, or Agent (instead of using the overflow condition).

Dial	⁎243
Dial	agent group access code
Dial	choice number (1-4)
Dial	access code
Dial	time delay in seconds (00-99) where 00 = automatic
Dial	⁎ to proceed to the next choice and repeat above three steps
Press	RELEASE when complete.

(j) Review recording time assignments.

Dial	⁎244
Dial	agent group access code
Dial	recording duration choice number (1-4)
Dial	⁎ to review other recording assignments and repeat above two steps
Press	RELEASE when complete.

(k) Assign Mean Time to Answer (MTTA) (nnn seconds) and overflow destination to RAC/RAD Programming Form. This destina-

tion may be the Supervisor, one specific extension, an agent group, a hunt group, or return to this group.

(l) Enter MTTA/overflow per Agent group.

Dial	*246
Dial	Agent group access code
Dial	MTTA time entered on RAC/RAD Programming Form (000 - 255 seconds)
Dial	overflow access code (for agent/recording group supervisor)
Press	RELEASE when complete.

(m) Review current MTTA and overflow code.

Dial	*246
Dial	agent group access code
Dial	#
Press	RELEASE when complete.

NOTE

1. EACH HUNT GROUP MUST CONSIST OF EITHER AGENTS ONLY, OR RECORDING ONLY

2. ALL RECORDINGS IN THE SAME HUNT GROUP SHOULD HAVE THE SAME MESSAGE

HUNT GROUPS
AGENT/RECORDING GROUPS

TO ENTER HUNT GROUP PROGRAMMING PRESS [HUNT GROUP] (EXTENSIONS OR TRUNK INFORMATION MUST BE ENTERED BEFORE TRUNK GROUP DATA)

[HUNT GROUP] DIAL 1-12 SEE NOTES 1 AND 2	[ACCESS CODE]	[DELETE]	PRESS [EQPT NUMBER] BEFORE DIALING EACH EQUIPMENT NUMBER ENTRY											[ENTER]
			33	34	35	36	37							
1	123													
2	2231		50	52										
3	2232		54	56										
4	2233		57											
5	2234		58											

TO SEE EQUIPMENT NUMBERS CURRENTLY IN A GROUP

[HUNT GROUP] [DIAL NUMBER 1-12] [EQPT NUMBER] [NEXT] [NEXT]

[HUNT GROUP] [NEXT] [NEXT]

TO MAKE A CHANGE TO A GROUP, THE LIST OF MEMBERS MUST BE RE-ENTERED. INDIVIDUAL MEMBERS CANNOT BE DELETED OR CHANGED. THE EXISTING GROUP LIST IS AUTOMATICALLY DELETED WHEN YOU START TO ENTER A NEW ONE.

FOR CIRCULAR GROUPS FIRST AND LAST NUMBERS MUST BE IDENTICAL.

TO DELETE A GROUP:

[HUNT GROUP] [DIAL NUMBER 1-12] [ACCESS CODE] [DELETE] [ENTER]

FORM0005R0

Figure 4-1 Hunt Groups Agent/Recording Groups Programming Form

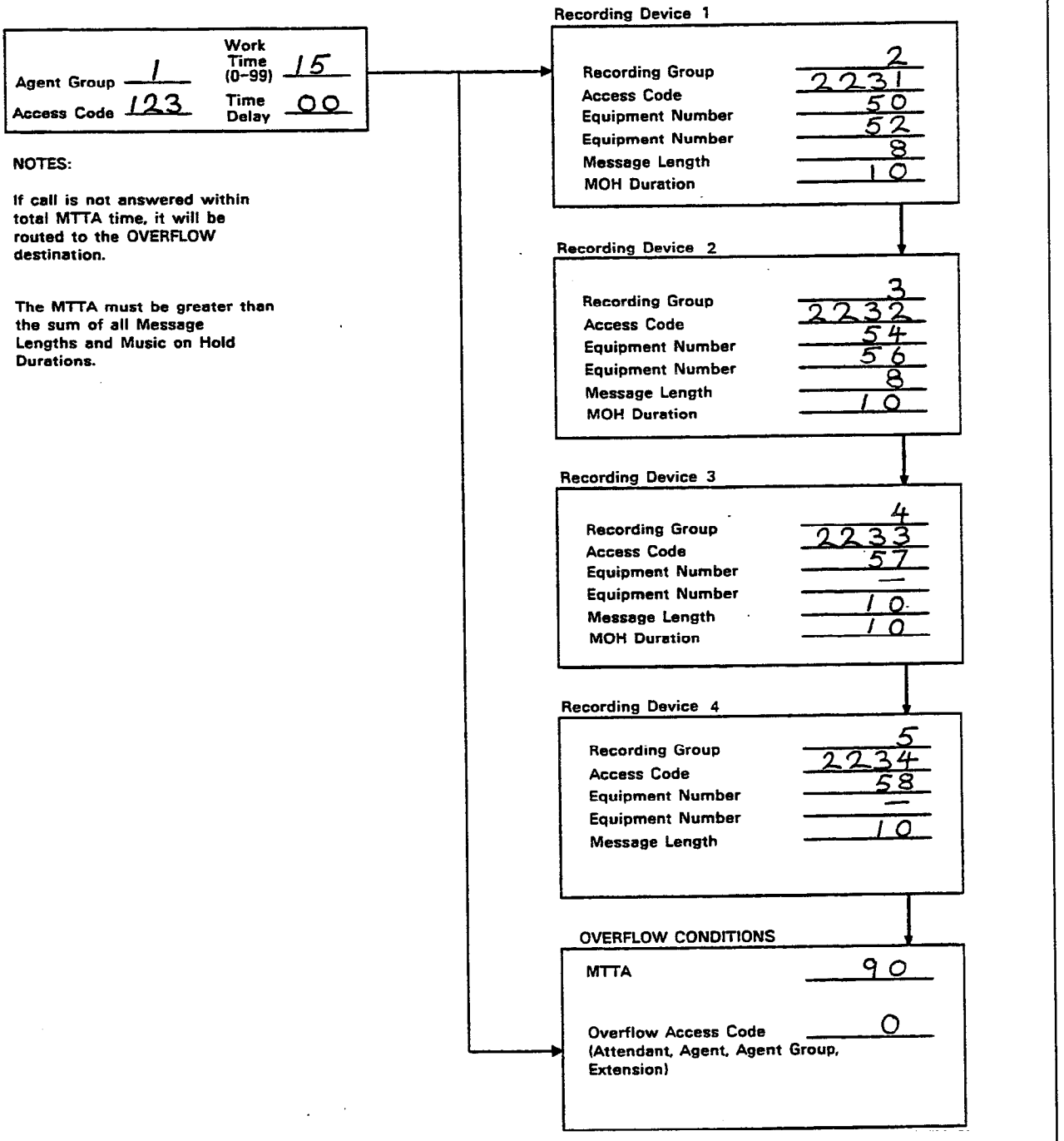


Figure 4-2 RAC/RAD Programming Form

5. SUPERVISOR FORMS

General

5.01 When setting up or changing ACD functions and assignments, the Supervisor should maintain up-to-date and accurate records about the system. The following forms may be used for this purpose.

FORM ACD-1 TRUNK GROUP/AGENT GROUP ASSIGNMENT

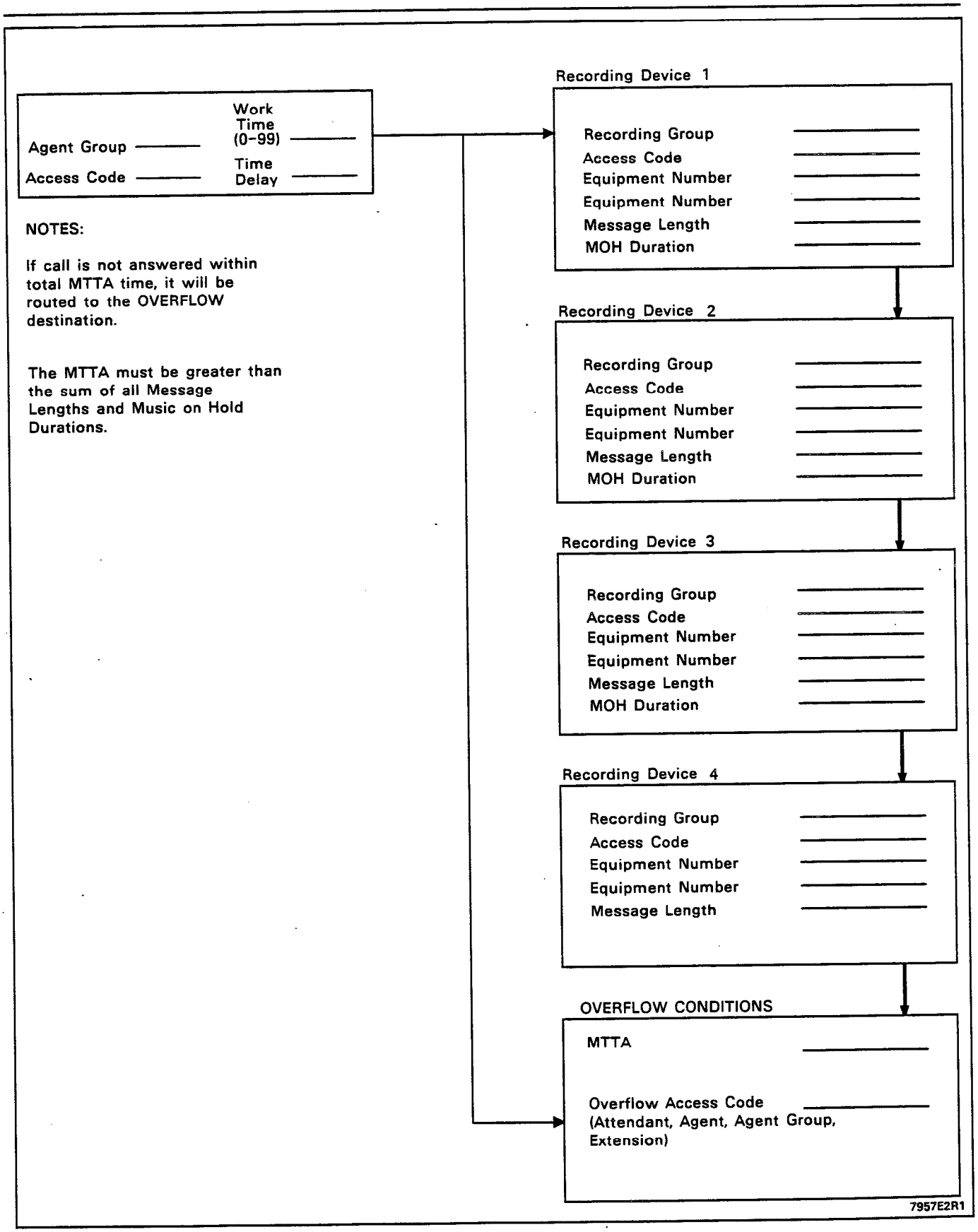
MODE	DAY SERVICE ____	AGENT GROUP ____
OF	NIGHT 1 SERVICE ____	ACCESS CODE ____
SERVICE	NIGHT 2 SERVICE ____	DESCRIPTION ____

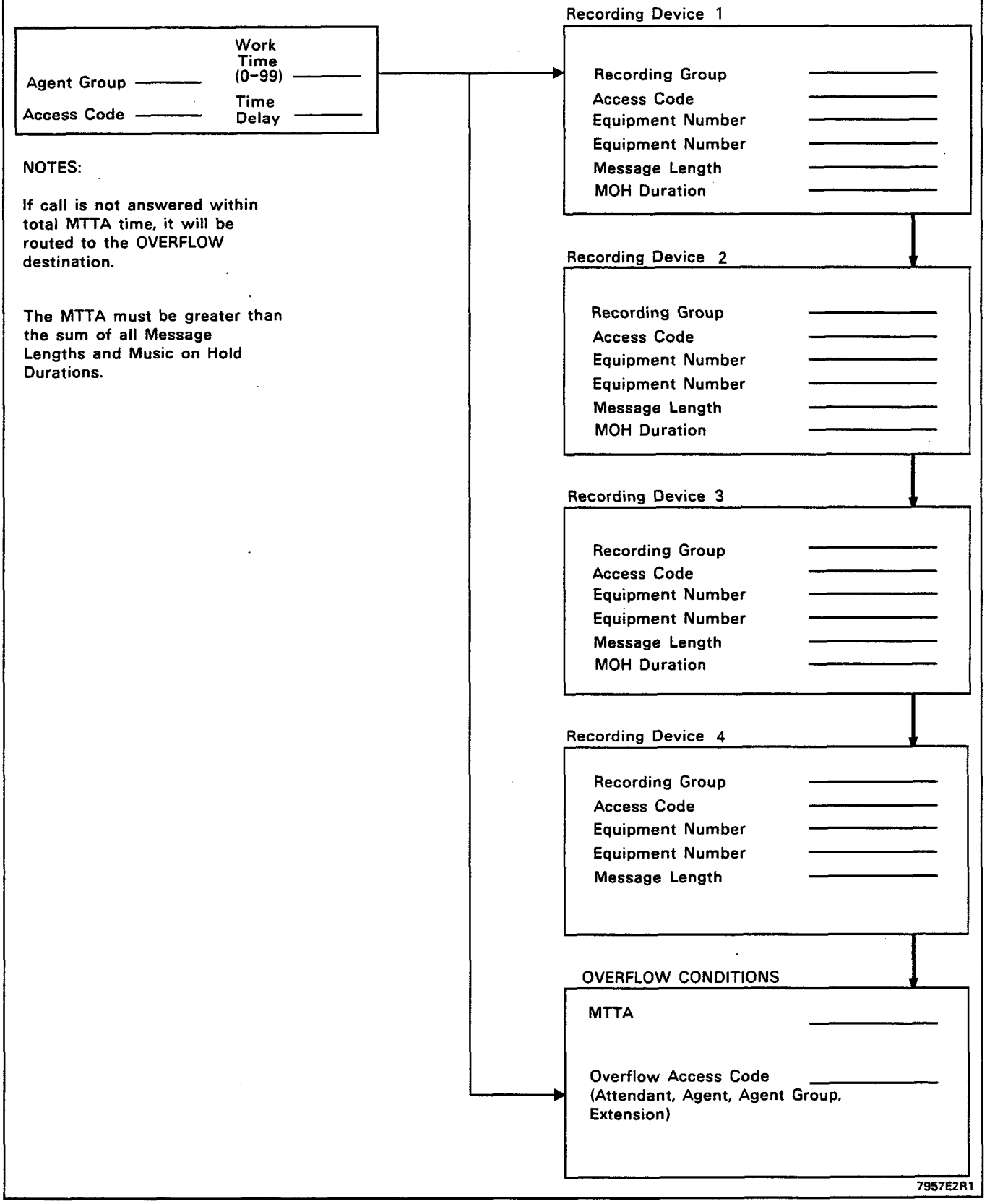
MODE	DAY SERVICE ____	AGENT GROUP ____
OF	NIGHT 1 SERVICE ____	ACCESS CODE ____
SERVICE	NIGHT 2 SERVICE ____	DESCRIPTION ____

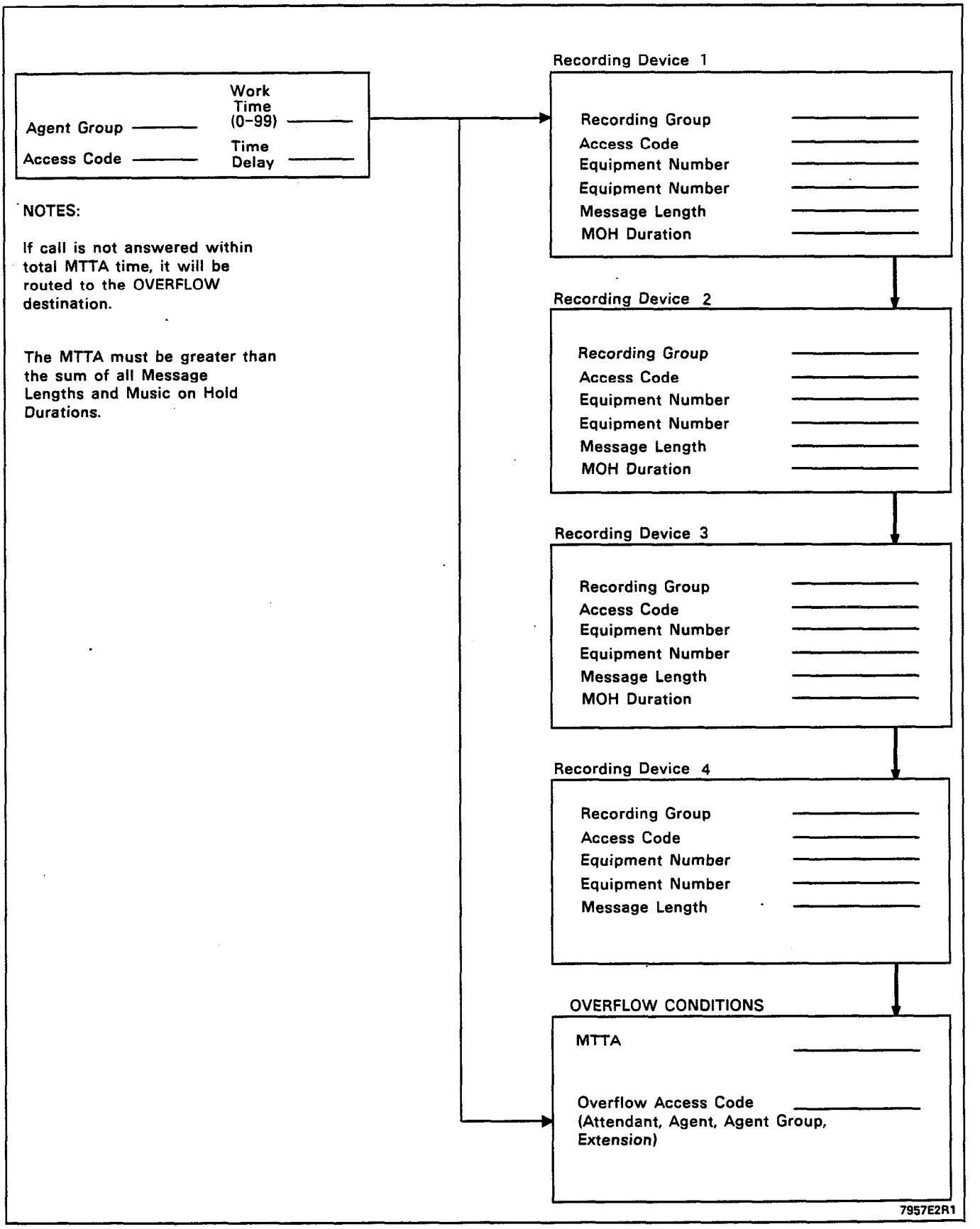
MODE	DAY SERVICE ____	AGENT GROUP ____
OF	NIGHT 1 SERVICE ____	ACCESS CODE ____
SERVICE	NIGHT 2 SERVICE ____	DESCRIPTION ____

LISTED DIRECTORY NUMBER	TRUNK EQUIPMENT NUMBER	PRIORITY (note 1)

Note: 1. Trunks in Trunk Group 12 have priority.


Agent Group
Work Time (0-99)
Access Code
Time Delay
NOTES:
If call is not answered within total MTTA time, it will be routed to the OVERFLOW destination.
The MTTA must be greater than the sum of all Message Lengths and Music on Hold Durations.
Recording Device 1
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 2
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 3
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 4
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
OVERFLOW CONDITIONS
MTTA
Overflow Access Code
(Attendant, Agent, Agent Group, Extension)
7957E2R1


Agent Group
Work Time (0-99)
Access Code
Time Delay
NOTES:
If call is not answered within total MTTA time, it will be routed to the OVERFLOW destination.
The MTTA must be greater than the sum of all Message Lengths and Music on Hold Durations.
Recording Device 1
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 2
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 3
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 4
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
OVERFLOW CONDITIONS
MTTA
Overflow Access Code
(Attendant, Agent, Agent Group, Extension)
7957E2R1


Agent Group
Work Time (0-99)
Access Code
Time Delay
NOTES:
If call is not answered within total MTTA time, it will be routed to the OVERFLOW destination.
The MTTA must be greater than the sum of all Message Lengths and Music on Hold Durations.
Recording Device 1
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 2
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 3
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
MOH Duration
Recording Device 4
Recording Group
Access Code
Equipment Number
Equipment Number
Message Length
OVERFLOW CONDITIONS
MTTA
Overflow Access Code
(Attendant, Agent, Agent Group, Extension)
7957E2R1

SX-100®/SX-200®
SUPERSWITCH®
ELECTRONIC PRIVATE AUTOMATIC BRANCH EXCHANGE
RECORDED ANNOUNCEMENTS

CONTENTS PAGE

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LIST OF ILLUSTRATIONS

FIGURE TITLE PAGE

1. INTRODUCTION

1.01 This Section provides information about recorded announcements used with the SX-100®/SX-200® PABX; it is divided into the following parts:

Part 1 outlines the Section.

Part 2 provides a general description of the types of recorded announcements available.

Part 3 describes how recorded announcements operate within the SX-100®/SX-200® PABX.

Part 4 gives installation instructions for recorded announcement equipment.

Part 5 describes how to enter recorded announcement data into the system.

Part 6 provides maintenance and test procedures for recorded announcement equipment.

Reason for Issue

1.02 This Section is issued to describe Recorded Announcements used in the SX-100®/SX-200® PABX.

2. GENERAL DESCRIPTION

2.01 The SX-100®/SX-200® PABX supports two types of recorded announcement equipment: MITEL Recorded Announcement Card (RAC), PN 9110-072-000-NA; and commercial Recorded Announcement Devices (RAD). When a recorded announcement is required, a recording group is scanned and an idle unit is connected to the trunk waiting for a recording.

2.02 A RAC occupies eight system ports for two messages while a RAD occupies one system port for one message.

Recorded Announcement Card

2.03 The Recorded Announcement Card (RAC) for the SX-100®/SX-200® PABX is a printed circuit card with two recorded announcement modules, which occupies one position of the card shelf. The RAC uses four of the eight equipment numbers assigned to its shelf position; the remaining four cannot be used. RAC firmware interfaces with Generic 217 PABX software. Each RAC has four audio channels, as follows:

module 1	record/playback channel 1	(2nd equip num)
	playback channel 2	(4th equip num)

module 2	record/playback channel 3	(6th equip num)
	playback channel 4	(8th equip num)

2.04 Each module includes a Random Access Memory (RAM) which contains one message, and two playback channels. Messages may be recorded on Channels 1 and 3 only; Channels 1 and 2 playback the message recorded on Channel 1, and Channels 3 and 4 playback the message recorded on Channel 3. Each pair of channels is arranged so that there is a time delay of 4 seconds between them. Thus one channel may transmit the first half of the message while the other channel is transmitting the second half of the message. If two listeners are connected to the two channels simultaneously, the listener connected to the second channel hears a 4 second silence before the message begins.

2.05 A battery on each module protects the RAM message for approximately 400 days in the event of power failure or card removal. Battery switches on the module must be set to CLOSED to protect the RAM when the RAC is in use. The message is lost if the switches are opened, if the batteries are removed from the module, if system power is lost while the switches are OPEN, or if the card is removed from the system while the switches are OPEN.

Recorded Announcement Device

2.06 A RAD is a Telephone Answering Machine, tape recorder, or similar answering device that is approved by the local Telephone Operating Company. It is connected through a local line circuit and must conform to industry standard specifications for automatic answer and automatic rewind (or endless tape). The message length is determined by the length of the tape supplied with the device, however, the system has a 99 second maximum message length restriction. The RAD is recorded off-line, following the manufacturer's instructions.

3. TYPICAL RECORDED ANNOUNCEMENT USE

3.01 A recorded announcement is used with the SX-100®/SX-200® PABX to provide a recorded message when certain situations occur, such as:

- all extensions in an agent hunt group are busy and cannot receive an incoming call;
- a wake-up call has been requested and a recorded message is provided as part of the wake-up call feature.
- an incoming call with Direct Inward Dialing requests an invalid extension number.

Note: Put all recording devices with the same message into the same recording group. Each recording group is identified and referenced by its access code. Upon answer, the recording is

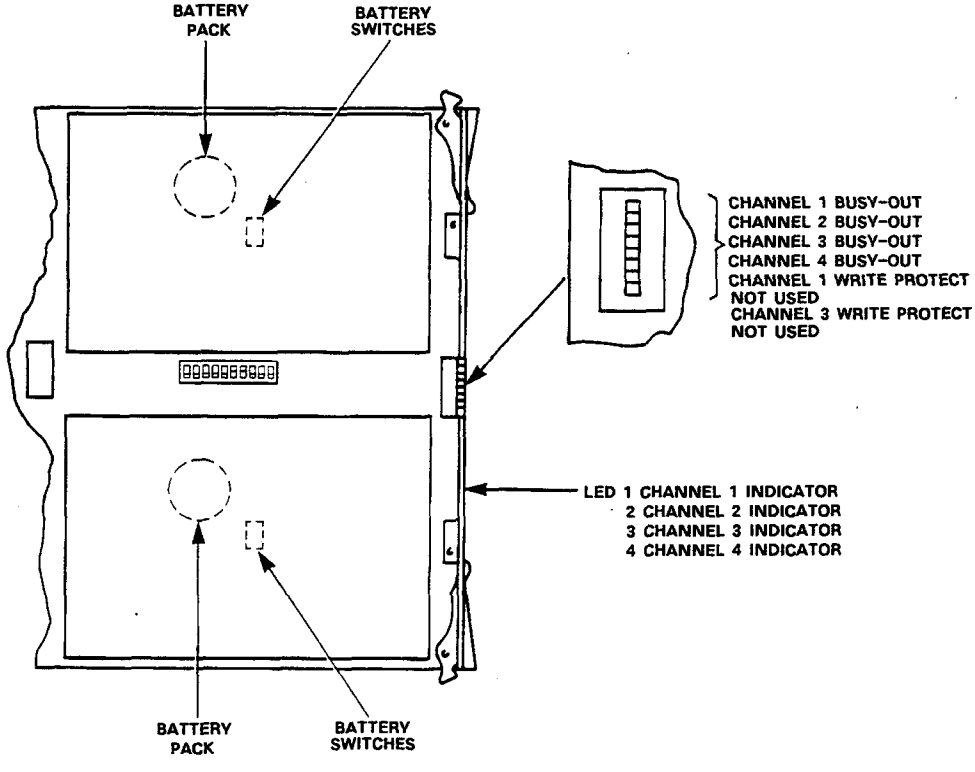

Figure 2-1 Recorded Announcement Card

timed; at the end of the specified time, the system disconnects the trunk from the recording.

All Agents Busy

3.02 The recorded announcement is used when all extensions in an agent group are busy. After a programmed delay, during which the caller hears ringback tone, the system automatically connects the incoming call to the recorded announcement. If an agent becomes free during the recorded announcement, the system immediately connects the caller to that agent.

3.03 When the message ends, and all agents/extensions are still busy, the system automatically transfers the call to the music-on-hold feature or to a silent hold condition. The recorded announcement may now be connected to another incoming call.

3.04 Note that an incoming call can only be connected to a recorded announcement if the busy extension is part of an agent group. An individual extension must be placed into an agent group of one member if calls to it are to be forwarded to a recorded announcement.

Automatic Wake-up Calls

3.05 Extensions which receive an automatic wake-up call can be connected to an assigned wake-up message when they answer the call; the system connects reorder tone to the extension when the wake-up message finishes. Programming the Automatic Wake-up feature must include assignment of the recording group to be accessed.

Intercept of Invalid DID calls

3.06 If a caller with direct inward dialing capability dials an invalid number, the system can forward the call to a recorded message. At the end of the message, the system either drops the call or directs it to the console as a DID intercept (System Option 135). Programming the Intercept feature must include assignment of the recording group to be accessed.

4. INSTALLATION

4.01 This Part explains how RACs and RADs are installed on an SX-100®/SX-200® PABX.

Recorded Announcement Card

4.02 Install the RAC into any vacant line or trunk slot (2 to 14 of shelf 1, or 1 to 12 of shelf 2). Each RAC reduces the number of available ports by 8 (2 or 4 trunks or 8 extensions). The second and sixth equipment numbers of this card position are required for programming the RAC.

Switches on the RAC

4.03 The switches on the RAC must be set as follows before the recorded announcements can be used:

- The two battery switches on each module must be closed.
- The bank of 10 switches in the centre of the trunk card must be set as follows:

  1 - open
  2 - open
  3 - closed
  4 - closed
  5 - open
  6 - open
  7 - open
  8 - open
  9 - open
  10 - open.

- The bank of eight switches on the edge of the trunk card must be set to OPEN. The switches may be set to CLOSED to busy out a channel or to write-protect a recorded message after the RAC is operational.

4.04 The top four switches (8 to 5) on the edge of the card, when CLOSED, busy-out the corresponding message channels, 1-4; the channel is unavailable for either record or playback. Figure 2-1 shows a RAC and its switches.

4.05 Switches 4 and 2 (Write Protect) can be set to CLOSED to disable recording on Channels 1 and 3 after recording a message, to prevent inadvertent overwriting by the Attendant. The messages can be overwritten from the attendant console ONLY if these switches are set to OPEN. Switches 1 and 3 are not used. For further details, refer to 'Recording a Message on a Recorded Announcement Card'.

Recorded Announcement Devices

4.06 Tape recorders, Telephone Answering Machines, and similar devices (RAD) are connected to the PABX as part of the installation procedures at the customer's site. Each RAD is connected to one line circuit (extension) of the PABX according to the manufacturer's instructions, at the cross-connection field. Each RAD may also require an AC line cord connection separate from the PABX line cord. Details of RAD installation are provided by the respective equipment manufacturer.

5. PROGRAMMING A RAC OR RAD - EXAMPLE

5.01 This Part describes data which must be entered into the system from the console before recorded announcements can be used.

- All RACs and RADs within one Recording Group must hold the same message.
- The length of the message in a recording group must be specified; it must not exceed 8 seconds if the group includes a RAC, but can be up to 99 seconds if the group contains only RAD(s).
- The attendant accesses a Recording Group by the Group Access Code assigned when the group was created.
- Each module on a RAC can be in a different Recording Group.
- Four equipment numbers (of eight assigned to a card position) are assigned for each RAC, two for each module. All four equipment numbers must be assigned; otherwise, only the assigned channels are used.

module 1	record/playback channel 1	(card position equip num 2)
	playback channel 2	(card position equip num 4)
module 2	record/playback channel 3	(card position equip num 6)
	playback channel 4	(card position equip num 8)

- Messages on RACs are recorded from the console; messages on RADs are recorded according to manufacturer's instructions.
- The data entry codes listed in the following paragraphs use * as the attendant function code. If another code has been specified for a particular system, this code should be used wherever * is shown.
- A RAD is assigned to one equipment number (standard line circuit tip and ring).
- Each recording group must be identified with a unique access code. Each RAC or RAD must be assigned to a recording group (if necessary, a group of one member).

5.02 The following is a listing of the commands which may be entered from the Attendant console to change parameters of the recorded announcements within the system. It does not include programming data which requires the console to be put into System Programming mode prior to entering the data.

A typical programming example is provided following the list of commands.

Assign a RAC Equipment Number

The installer supplies a list which includes the equipment number for the record/playback channel of each equipped RAC module. The system automatically increments this number by 2 and assigns the incremented number to the playback-only channel of the same module.

Dial	*231
Dial	equipment number of record/playback channel
Dial	* to proceed to the next equipment number
Press	RELEASE.

Remove a RAC Equipment Number

Both equipment numbers of one module are removed together.

Dial	*231
Dial	equipment number for the record/playback channel
Dial	#
Press	RELEASE.

Assign a RAD Equipment Number

The installer supplies a list which includes the equipment number of each equipped RAD.

Dial	*230
Dial	equipment number for the tape recorder
Dial	*
Press	RELEASE.

Remove a RAD Equipment Number

Dial	*230
Dial	equipment number of RAD
Dial	#
Press	RELEASE

Record a Message on a RAC

This procedure is used to record the first message or to replace an existing message on a module. It will not function if the write-protect switch for that RAC module is CLOSED.

Prepare the message and check that it does not exceed 8 seconds

Dial	*240
Dial	equipment number for the RAC
Dial	*
Wait	for a "beep" in the handset
Speak	the message into the handset
Press	RELEASE.

Assign a Recording Group for DID Intercept Routing

5.03 A recorded announcement can be used to provide a standard message whenever an incoming Direct Inward Dial call has dialed an incorrect number, rather than routing the call to an Attendant or to reorder tone. When a recording group has been defined for intercept (*233 sequence), the intercepted call is routed to the recording, and if still connected at the end of the recorded announcement, then to the attendant. Refer to system programming for complete details (Section 9105/9110-096-210-NA).

Dial *233
Dial Recording Group Access Code
Press RELEASE

To delete a Recording Group for DID Intercept Routing

Dial *233
Dial #
Press RELEASE.

Assign a Recording Group for Automatic Wake-up Calls

5.04 An SX-100®/SX-200® system which uses the Automatic Wake-up feature can have each extension called by the wake-up feature connected to a recorded announcement, rather than being connected to music or to special wake-up tone (miscellaneous tone, 100 ms ON, 400 ms OFF). Refer to system programming for details (Section 9105/9110-096-210-NA).

Dial *234
Dial Recording Group Access Code
Press RELEASE

To delete a Recording Group for Automatic Wake-up Calls

Dial *234
Dial #
Press RELEASE.

Link Two RAC Messages Together

Record the messages onto two sequential RACs. Specify 01 second music on hold between recordings (refer to RAC/RAD Programming form).

Specify RAC data into system using *231 code. (RAC must have been programmed into system according to Hunt Groups Agent/Recording Groups Programming form.)

The second message will follow the first message, with approximately 1 second delay between the messages. (If a 00 second music on hold duration is specified, the system calculates an average delay time between recordings.)

Play Back a Message from a RAC

Dial ⁎241
Dial equipment number of RAC
Dial ⁎

Listen to the message in the handset (busy tone indicates that the message is in use)

Press RELEASE when the message finishes.

Specify Recorded Message Length

The duration of each recorded announcement message is used to disconnect the caller from the recording and return him/her to music on hold. For RAC recording groups the duration will always be 8 seconds or less; for RAD recording groups the duration of messages can vary.

At the console, specify the message length for each device as follows:

Dial ⁎242
Dial Recording Group access code
Dial recording duration, in seconds

The console displays:

source XXXX TT
dest

where XXXX - Recording Group access code
TT - recording duration (00-99 s).

Review Equipment Numbers of Recorded Announcement Equipment

Dial ⁎232⁎

The first equipment number assigned to a recorded announcement equipment is displayed as the SOURCE NUMBER and the type of recorded announcement equipment is displayed as the SOURCE CLASS. Device types are:

0 for a RAD
1 for a RAC

Dial ⁎ to display details of the next assigned equipment number
Press RELEASE to terminate the review.

Typical Programming Example

5.05 Prepare and enter Recorded Announcement data into the PABX as follows:

1) Specify equipment numbers for equipped RADs into system.

Dial ✳230
Dial RAD port equipment number
Dial ✳ to proceed to equipment number of next RAD
Dial RAD port equipment number
Repeat above two steps for further RAD port assignments
Press RELEASE when complete.

2) Specify equipment numbers for equipped RACs into system.

Dial ✳231
Dial equipment number for the first RAC record/playback channel (second equipment number of RAC slot)
Dial ✳ to proceed to the next equipment number
Dial equipment number for the second RAC record/playback channel (sixth equipment number of RAC slot)
Repeat above two steps for further RAC assignments
Press RELEASE when complete.

Dial ✳232✳ to review assignments

Dial ✳ to proceed to the next equipment number.

Note: The system automatically increments the record/playback channel equipment number by two to define the playback-only channel of the same module.

3) Define hunt groups, and recording groups on the HUNT GROUP AGENT/RECORDING GROUPS form. Figure 5-1 shows a form completed with a typical PABX assignment; one circular hunt group and four recording groups. A RAC is installed in slot 7; therefore its equipment numbers are 50, 52, 54 and 56. RADs are connected to the first two line circuits of slot 8; therefore their equipment numbers are 57 and 58.

4) Put the Attendant console into SYSTEM PROGRAMMING mode (refer to Section MITL9105/9110-096-210-NA) and program the data recorded on the Hunt Groups Agent/Recording Groups form into the system:

Press HUNT GROUP and enter hunt group number (1-12)
Press ACCESS CODE and enter access code
Press EQUIPMENT NUMBER and enter equipment number
Repeat above two steps for further equipment number entries
Press ENTER when complete
Repeat above three steps for each hunt group
Exit from PROGRAMMING mode.

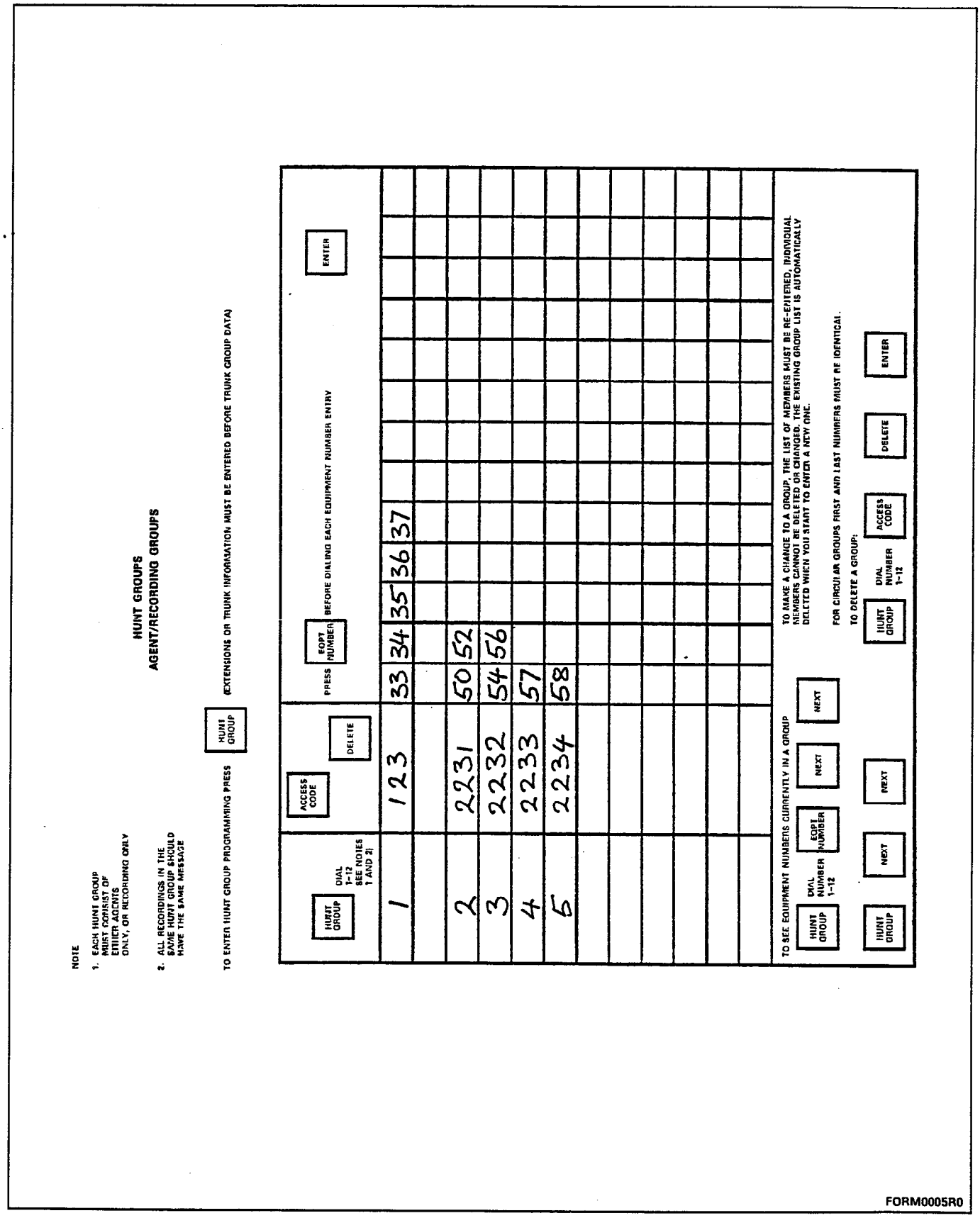

Figure 5-1 Hunt Groups Agent/Recording Groups Programming Form

Note: All recording groups being used, including a group with only one member, must be identified on the Hunt Groups Agent/Recording Groups form and programmed into the PABX.

5) Specify recorded message length times into system from Attendant console (in normal operating mode, not programming mode).

Dial ✳242
Dial recorded group access code
Dial message length time in seconds (nn)
Press RELEASE when complete
Repeat above steps for all recording groups.

6) When changing recorded announcement assignments, maintain an up-to-date and accurate record on the Hunt Groups Agent/Recording Groups form.

6. MAINTENANCE AND TESTING

6.01 This Part describes the maintenance and test procedures relevant to Recorded Announcement equipment connected to the PABX.

6.02 The Part does not cover maintenance and testing of Recorded Announcement equipment removed from the system.

Maintenance Procedures

RAC

6.03 Like all PCB cards, the RAC is susceptible to damage by the discharge of static electricity. To reduce the possibility of damage, observe recommended PCB handling precautions when handling a RAC or its modules.

RAD

6.04 Carry out RAD maintenance as instructed by the device manufacturer.

Test Procedures

RAC

6.05 Carry out the following test procedure if the attendant reports that a RAC is not working. This test procedure assumes that the RAC is in slot 6, shelf 1 of the equipment cabinet, and that equipment numbers 042, 044, 046 and 048 have been assigned to its four channels. Consult the installation forms for equipment numbers if the RAC is in another slot.

6.06 The test checks that a recorded message from each of the four channels on the RAC can be heard in the console handset. The RAC should be replaced if a message cannot be heard in one or more channels.

6.07 Before starting the test, confirm that a message has been recorded on each module of the RAC. If necessary, record a message as described in Programming a RAC or RAD.

1. Remove the RAC card from slot 6.

2. Check that the 10 switches between the two modules are set as described in Part 4, INSTALLATION of this Section.

3. Check the equipment number of the RAC by dialing

   232

   The console SOURCE NUMBER displays the equipment number of the record/playback channel of the first module (042 in this example); the SOURCE CLASS should display 1 indicating that the device is a RAC.

4. Press *

   The console SOURCE NUMBER displays the equipment number of the record/playback channel of the first module (042 in this example); the SOURCE CLASS displays 1 indicating that the device is a RAC.

5. Play the message on the record/playback channel on the first module of the RAC by dialing

   241 042

   The message should be heard in the handset.

6. Play the message on the playback-only channel of the first module on the RAC by dialing

   241 044

   The message should be heard in the handset. There may be a delay of up to 4 seconds before the message is heard; this is normal.

7. Play the message on the record/playback channel of the second module on the RAC by dialing

   241 046

   The message should be heard in the handset.

8. Play the message on the playback-only channel of the second module on the RAC by dialing

   241 048

   The message should be heard in the handset. There may be a

delay of up to 4 seconds before the message is heard; this is normal.

9. The recorded announcement card is serviceable if a message is heard on each of the four channels.

10. Replace the RAC if a message cannot be heard on any channel.

RAD

6.08 Perform the following test if the attendant reports that a recorded message from a RAD is not working. Before carrying out this test, verify that a message is recorded on the RAD.

6.09 The test checks that the message can be heard in the console handset. The RAD should be disconnected from the system for further testing if a message is not heard.

1. Check the equipment number of the RAD by dialing

   232

   The console SOURCE NUMBER displays the equipment number; the SOURCE CLASS displays 0 to indicate that the device is a RAD.

2. Play the message on the RAD by making all agents in the group busy, and then dialing the CO directory number of the agent group - this will connect you to the RAD recording. The message should be heard in the console handset.

3. Press the RELEASE key when the message ends.

4. The RAD is serviceable if a message is heard in the console handset.

5. Disconnect the RAD if a message cannot be heard in the console handset.

6.10 If an activated RAD/RAC does not respond with the correct response (an off-hook in the case of a RAD), then an E099 "lockout" alarm will be sent to the console. The alarm is of the form:

E099 NNN

Lo

where NNN is the RAD/RAC eqpt. no.

The port is then "busied out" to prevent further use; it may be "unbusied" by using the standard *9 console function.

6.11 The RAC processor has the capability of generating an error report indicating a message timing fault (hardware failure). The system will report this as a minor alarm:

E030-ss-
qqq-003-

where: ss - slot where RAC is installed
qqq - equipment number of RAC.

7. HANDLING BATTERIES WHICH CONTAIN LITHIUM

WARNING

SERVICING OF THE RAC MUST BE DONE BY QUALIFIED SERVICE PERSONNEL ONLY.

7.01 The batteries used in the stand-by power supplies on the RAC contain lithium. They are safe in normal use, but the following health and safety precautions must be observed:

1. Do not puncture, crush, or try to open the battery case;
2. Do not burn the battery or subject the battery to extremes of heat; for example, by attempting to solder directly to the battery case;
3. Do not attempt to recharge batteries which are not specifically designed as rechargeable types;
4. Do not short circuit the battery terminals;
5. Always check that batteries have been correctly inserted into the card;
6. Do not connect lithium batteries in series or parallel without including suitable fuses and diodes in the circuit.

Leakage of Electrolyte

7.02 Electrolyte is released if a battery is ruptured. The electrolyte, which is usually a liquid but may be a jelly or paste, is a strong ACID.

7.03 Remove electrolyte from equipment and clothing with copious amounts of water but DO NOT allow the water to come into contact with the ruptured battery.

7.04 Use large quantities of water to remove electrolyte from the skin and eyes and seek IMMEDIATE MEDICAL ATTENTION.

Overheating or Venting due to Abuse

7.05 The battery may vent a gas or may overheat if abused. If either condition is observed when the battery is in service:

1. Remove the RAC from the equipment cabinet
2. Take the RAC outside or to a well ventilated area and allow it to cool
3. Remove the battery when it is cool and has stopped venting and install a new battery.

Disposing of Damaged or Spent Batteries

7.06 The battery does not contain any materials which have a lasting poisonous effect. However, it does contain corrosive materials which will ultimately decompose to form harmless substances. Dispose of batteries which have been damaged mechanically or have been discharged to a terminal voltage of 1.0 V according to locally approved procedures for disposal of hazardous waste.

SX-100®, SX-200®
SUPERSWITCH®
ELECTRONIC PRIVATE AUTOMATIC BRANCH EXCHANGES
GENERIC 217: ASSOCIATED MODEM LINE FEATURE
DESCRIPTION AND OPERATION

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LIST OF TABLES

1. INTRODUCTION

General

1.01 **Generic 217** brings integrated voice and data communications to MITEL's SX-100® and SX-200® PABXs. This document describes the features and services provided by one aspect of **Generic 217 -- Associated Modem Line Feature.**

Reason for Issue

1.02 This Practice is issued to provide a complete description of the installation, programming and operation of the Generic 217 operating system's data features contained in the **Associated Modem Line Feature** package, when used with the SX-100® and SX-200® PABXs.

Associated Modem Line Feature: General Description

1.03 Generic 217 is the newest in a series of MITEL system operating software packages (Generics) for the SX-100® and SX-200® Electronic PABXs. It now includes **Associated Modem Line Feature,** the software package that turns the SX-100® and SX-200® PABXs into **integrated** voice and data communications systems.

1.04 **Associated Modem Line Feature** provides a way for personal computers (PCs) to exchange data through the PABX, to take full advantage of the PABX's cost-saving features. The PC user controls the data call using a SUPERSET 4™ set which **Associated Modem Line Feature** associates with the PC making the data call. Figure 1-1 shows a typical configuration of **Associated Modem Line Feature.** Use **Associated Modem Line Feature** in conjunction with the following:

- IBM* PCs
- Hayes*-compatible smart-modems
- PC Communications Software Packages such as Crosstalk* and Smartcom*
- SUPERSET 4™ sets.

1.05 **Associated Modem Line Feature** allows the PC to make data calls which are switched through the PABX. Consequently, dedicated data call trunks are no longer needed. Once a data call has ended, the trunk is entirely free to be used for voice calls. The customer is therefore able to keep his trunk requirements to a minimum.

Enhancements

1.06 **Associated Modem Line Feature** brings several enhancements to the SX-100®and SX-200® product line. Among them are:

- **Enhanced Calls:** Telephone numbers can be stored in the PC's memory, enabling it to place the desired calls. When the PC is

* IBM is a Trademark of International Business Machines Corporation.
Hayes and Smartcom are Trademarks of Hayes Corporation.
Crosstalk is a Trademark of Microstuf.

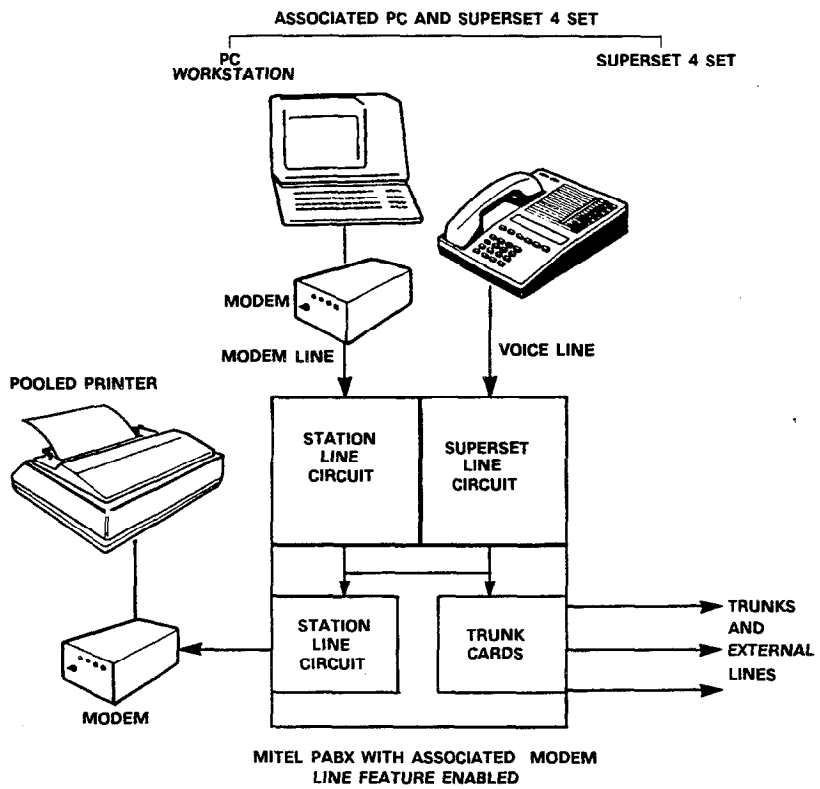

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Figure 1-1 ASSOCIATED MODEM LINE FEATURE - Typical Configuration

instructed to dial a number followed by the * character, the PABX passes control of the call to the SUPERSET 4™ set which **Associated Modem Line Feature** associates with a modem line. Automatically, the SUPERSET 4™ set is placed in handsfree mode, and the PC is disconnected from the call. When the PC is instructed to dial a number NOT followed by the * character, but followed by the # character, the PC is left connected to the call and is in data communication. The SUPERSET 4™ set is free to make or receive calls.

Note: SMARTCOM and CROSSTALK do not support the * -character end-of-dial feature. Control of a call dialed with the * character will in such cases remain with the PC. The modem will not hang up after the number is dialed.

- **Enhanced DISA and DIL Trunks:** Using DIL or DISA trunks allows a remote PC to directly dial in to a PC connected to the PABX. The DIL or DISA trunk can be used as a voice trunk in Day Service, and as a data trunk for Night Service, permitting data transfer when the PABX is in Night Service.

- **Added Security** against illegal data access: DISA trunks, which require the dialing of an additional access code, can be used to dial in to a PC. DISA trunks also provide access to more than one PC from a single inward trunk.

- **Printer Pooling:** A printer may be shared among a group of PC users. The printer is connected to a modem line via modem, and assigned a station number. PC users are then provided with a key-line appearance of the printer's station number on their SUPERSET 4™ sets. Files can then be transferred from the PC to the pooled printer. When the printer is in use, all SUPERSET 4™ sets with a line appearance of the printer indicate the line is busy.

- **Enhanced Hunt Groups:** Several data devices such as printers and their modems can be placed in Hunt Groups. The PC user can then access the Hunt Group and be connected to the first available printer.

- **Enhanced ARS:** External Data Calls can take full advantage of the PABX's Automatic Route Selection, when the ARS features are enabled. This permits the data call to be completed via the most cost-effective external line or trunk.

- **Enhanced System Speed Dial:** A PC can be used to dial a system speed dial number. This permits both voice and data call numbers to be stored as speed dial numbers.

2. PHYSICAL DESCRIPTION

2.01 **Associated Modem Line Feature** is an EPROM-based firmware module located on the Integrated Processor Control (IPC) Card.

3. FUNCTIONAL DESCRIPTION

General

3.01 This Part outlines the general operation of **Associated Modem Line Feature** voice and data call handling. For more detailed information about operation, refer to Part 4 of this Practice.

3.02 **Associated Modem Line Feature** associates two equipment ports in the PABX for each integrated voice and data communication station. One of the two ports is assigned as a modem line, while the other is assigned as a SUPERSET® port. Each is separately wired, and is not physically linked to the other in any way. Refer to Part 5 of this Practice for information regarding the association of SUPERSET® ports with modem lines.

3.03 **Associated Modem Line Feature** is capable of switching data through any external or internal line, CO or E&M trunk without serious degradation of the data carrier or data signals.

3.04 Data transfer can take place at a rate of from 300 to 2400 baud, as determined by the user's modem baud rate.

Call Handling

3.05 The PABX considers the SUPERSET 4™ set voice port and modem line as two separate and distinct stations. Each is therefore capable of call origination or call answering. There are four types of calls **Associated Modem Line Feature** can handle:

- Voice Only (Internal or External Call)
- Data Only (Internal or External Call)
- Simultaneous Voice and Data Call (External Call, Two Trunks; Internal Call, Two Lines)
- Alternating Voice and Data Call (External Call, Single Trunk; Internal Call, Single Line).

Each of these is described below. In these descriptions, it is assumed that **Associated Modem Line Feature's** data capability has been enabled in both the SUPERSET 4™ set user's class-of-service and the modem line's class-of-service and that the Associated Modem Line has been programmed during SUPERSET 4™ programming. Refer to Part 5 of this document for information on programming **Associated Modem Line Feature.**

Voice Calls

3.06 Example 1 in Figure 3-1 shows the connections made in completing a voice call with **Associated Modem Line Feature.**

3.07 Voice Calls can be initiated in one of two ways:

- Using the SUPERSET 4™ set
- Using the PC.

3.08 Using the SUPERSET 4™ set: The SUPERSET 4™ set user has access to all voice features available at his or her SUPERSET 4™ set. If the user originates or receives a call, the SWAP message appears on the SUPERSET 4™ set features display. Pressing the SWAP softkey gives the user access to **Associated Modem Line Feature's** data features by transferring the call to the associated modem line.

3.09 Using the PC: The PC can be used to dial a voice call. The voice number is programmed at the PC, followed by the * character. The user's smart modem will then dial the number, transfer the call to the SUPERSET 4™ set and return the modem to an on-hook condition. The SUPERSET 4™ set is placed in handsfree operation. The set is now ringing the number dialed from the PC.

Note: This feature is **not** supported by the SMARTCOM and CROSS-TALK communications software packages.

Data Calls

3.10 As with voice calls, **Data Calls** can be originated using either the SUPERSET 4™ set or the PC. Example 1 in Figure 3-1 shows the connections made in completing a data call.

3.11 Using the SUPERSET 4™ set: The set user dials a data call number at the set, then presses the SWAP and HANG-UP softkeys. Control of the call is passed to the PC, leaving the SUPERSET 4™ set free to make or receive voice calls.

3.12 Using the PC: The PC's communications software dials a data call number, followed by the # character. No special commands are necessary. When a data call is made in this way, the operation of the SUPERSET 4™ set is not affected in any way.

Simultaneous Voice and Data Calls

3.13 Simultaneous voice and data calls utilize two trunks, external lines or internal lines. Example 3 in Figure 3-1 shows the connections made in completing a simultaneous voice and data call.

3.14 Both the PC and the SUPERSET 4™ set can be used to originate a simultaneous voice and data call.

3.15 Using the SUPERSET 4™ set: The set user dials a data call number at the SUPERSET 4™ set, then presses the SWAP and HANG-UP softkeys. Control of the data call is passed to the PC. Next, the set user dials a voice call number from the SUPERSET 4™ set. Control of the voice call remains with the SUPERSET 4™ set.

3.16 Using the PC: To establish a simultaneous voice and data call, the PC first dials a voice call number followed by the * character. **Associated Modem Line Feature** does the following:

1. transfers the voice call to the associated SUPERSET 4™ set,
2. places the SUPERSET 4™ set in handsfree mode, and

3. disconnects the PC from the call, placing the modem line in a locked-out condition.

Next, the PC goes on-hook, then off-hook, then dials the data call number, followed by the # character. The data call is connected to far-end PC equipment through the user's modem.

Note: SMARTCOM and CROSSTALK **do not** permit transferring control of a call dialed from the PC to the SUPERSET 4™ set when the call is dialed from the PC followed by the # character.

Alternating Voice and Data Calls

3.17 Only one trunk or line is utilized during alternating voice and data calls. The user alternates between the two types of calls without releasing the trunk or line.

3.18 During a voice call, it may sometimes be necessary for the user to temporarily enter into a data call, then continue with the voice call. Similarly, during a data call it may be necessary to enter into a voice call, then continue with the data call. **Associated Modem Line Feature** permits the user to alternate between these call types. Example 2 in Figure 3-1 shows the connections for completing an alternating voice and data call.

3.19 Once a voice or data call is established, the SUPERSET 4™ set user presses the SWAP softkey. The call will be transferred to the associated port. A call made from the SUPERSET 4™ set is transferred to the associated modem line and becomes a data call. A call made from the PC is transferred to the SUPERSET 4™ set, which places the set in handsfree mode.

SUPERSET 4™ Set Operation

3.20 For voice calls, the SUPERSET 4™ set operates under **Associated Modem Line Feature** as it does under SX-100® and SX-200® Generic 217. For data calls, some restrictions apply, and are detailed below. Messages relating to the data calls are displayed on the SUPERSET 4™ set's 16-character alphanumeric LCD.

SUPERSET 4™ Set SWAP Feature

3.21 When the SUPERSET 4™ set seizes a trunk or external line, the SWAP softkey prompt is displayed in the features display of the set. Pressing the SWAP softkey transfers control of the call to the PC. The PABX checks that the modem line is not busy, and, if it is idle, sets it in a connected condition. The user then places the modem in ORIGINATE mode if originating the data call, or in ANSWER mode if the far-end party is originating the data call.

SUPERSET 4™ Set HANG-UP Feature

3.22 The HANG-UP softkey releases the SUPERSET 4™ set from a call. If a simultaneous voice and data call is in progress, pressing HANG-UP will only terminate the voice call. If no data call is in progress, pressing HANG-UP will cause the seized trunk to be released.

DATA BUSY Message

3.23 If a SUPERSET 4™ set attempts to swap to a data call, and the modem line is busy, the message "DATA BUSY" appears on the SUPERSET 4™ set LCD. To return to a voice call, the user must press CANCEL.

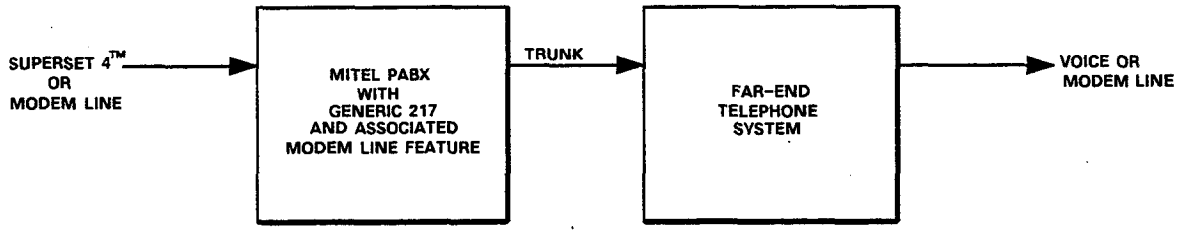
DATA TRANSFER Message

3.24 The message "DATA TRANSFER" is displayed on the SUPERSET 4™ set when a data call is entered into using the set's SWAP softkey. In this case, SWAP and HANG-UP are the only active softkeys. If a data call is entered into by the PC without using the SUPERSET 4™ set, no message is displayed.

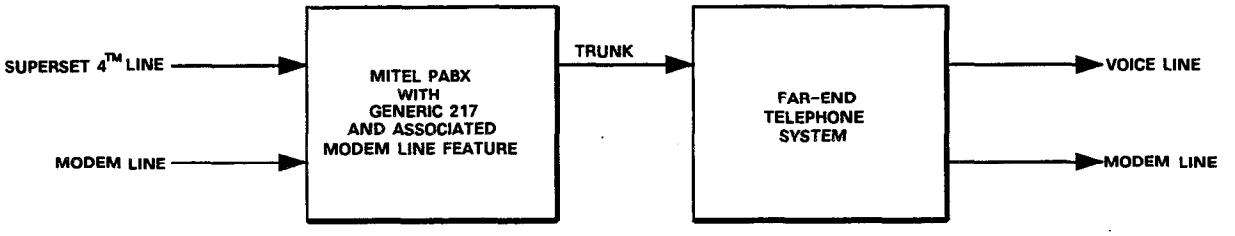
SUPERSET 4™ Set During Data Transfer

3.25 During data transfer, the SUPERSET 4™ set is on hold. When control of the call is returned to the set after a data call has been completed, the set is forced into handsfree mode. The SWAP and HANG-UP softkeys are the only active softkeys when the "DATA TRANSFER" message is displayed. When the "DATA BUSY" message is displayed the only active softkey is CANCEL.

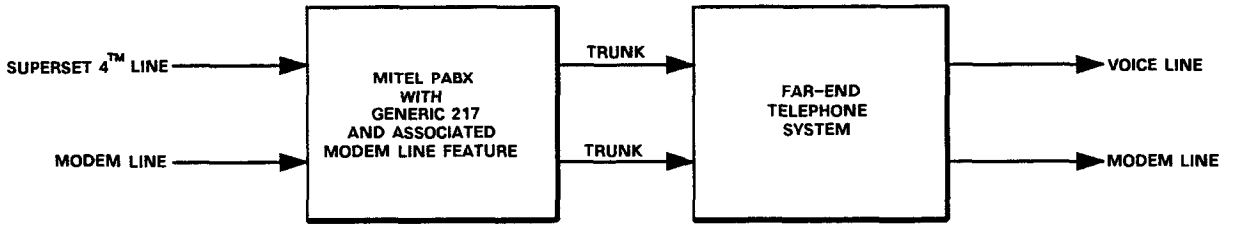
3.26 During data transfer, in an alternating voice and data call the SUPERSET 4™ set cannot transfer the call to another extension, or initiate a conference. The SWAP CAMP-ON feature is not available.



EXAMPLE 1: VOICE OR DATA CALL ONLY (EXTERNAL)



EXAMPLE 2: ALTERNATING VOICE AND DATA CALL (EXTERNAL)

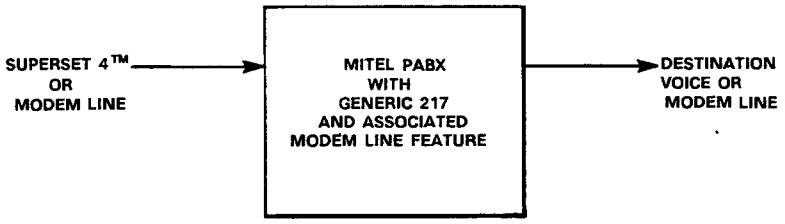


EXAMPLE 3: SIMULTANEOUS VOICE AND DATA CALL (EXTERNAL)

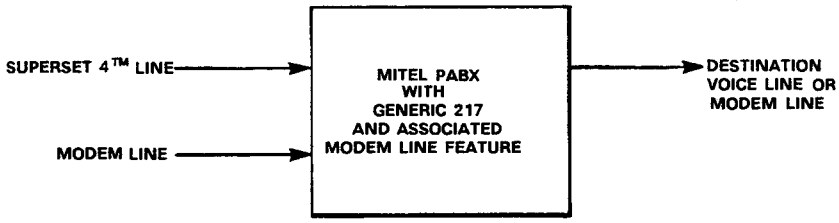
NOTES: MODEM LINES CONNECT TO COMPUTER EQUIPMENT VIA MODEM.
IT IS NOT REQUIRED THAT THE FAR-END TELEPHONE SYSTEM BE A MITEL PABX

8626R0E2

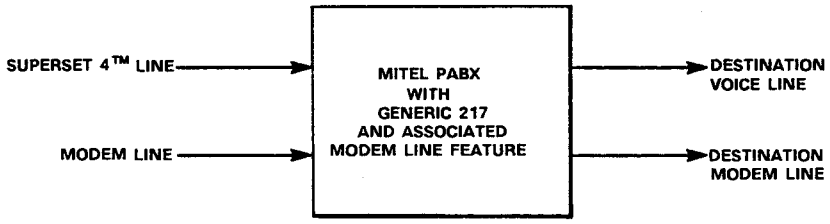
Figure 3-1a Associated Modem Line Feature Voice and Data Calls - External



EXAMPLE 1: VOICE OR DATA CALL ONLY (INTERNAL)



EXAMPLE 2: ALTERNATING VOICE AND DATA CALL (INTERNAL)



EXAMPLE 3: SIMULTANEOUS VOICE AND DATA CALL (INTERNAL)

NOTES: MODEM LINES CONNECT TO COMPUTER EQUIPMENT VIA MODEM. IN ORDER TO USE EITHER THE SWAP OR * TRANSFER FEATURES, BOTH THE CALLING AND CALLED EXTENSIONS MUST HAVE SUPERSET 4™ SETS, ASSOCIATED MODEM LINES, AND COS OPTION 126 ENABLED.

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Figure 3-1b Associated Modem Line Feature Voice and Data Calls - Internal

4. DATA FEATURES DESCRIPTION

General

4.01 This Part describes the operation of **Associated Modem Line Feature's** data features and call capabilities in detail. Attention is paid to feature requirements and conflicts, as well as to scenarios of the actual operation of these features. Only those features relating to **Associated Modem Line Feature** and their effect on SUPERSET 4™ sets are described. For descriptions of system and SUPERSET® features other than these, refer to the Features and Services Description Section, MITL9105/9110-096-105-NA, and the SUPERSET 4™ Set Section, MITL9105/9110-096-107-NA.

4.02 The description of each feature contains the following parts:

- **Description** - a general description of the feature.
- **Conditions** - any special conditions which should be taken into account before the feature is selected, or can operate.
- **Operation** - a detailed outline or scenario of the operation of the feature.

General Operational Considerations

4.03 For the data features to operate correctly, the installer must ensure that modem lines have been correctly assigned in the system, via SUPERSET 4™ programming and that both the SUPERSET® voice port and associated modem line have the COS Option "Associated Modem Line" enabled in their Classes-of-Service. Refer to Part 5 of this Practice for programming information.

4.04 ABBREVIATED DIAL/SPEED CALL

Description

Abbreviated Dial (also called Speed Call) allows extensions to access numbers stored in common-use or personal-use tables. Numbers are stored against table entry numbers, and are accessed by dialing an access code and the table entry number. The PC can be used to dial Abbreviated Dial numbers.

Conditions

- Abbreviated Dial numbers dialed from the PC must be followed by either the # character or * character.
- Refer to Section MITL9105/9110-096-220-NA for further information.

Operation

- Use the PC to dial the Abbreviated Dial Access Code and table entry number, followed by either * or #.
- When the Abbreviated Dial number is followed by *, control of the call is transferred to the associated SUPERSET 4™ set. When the number is followed by #, the PC retains control of the call.

4.05 ACCESS PRIVATE DATABASES

Description

The user can access databases which are not part of the local area network. The call to the database is established either by 1) a direct-dial number, or 2) through the database service Attendant. The call to the database can either be made through the PC, or through the user's SUPERSET 4™ set. If the call is established from the SUPERSET 4™ set, the user can press the SWAP and then HANG-UP softkeys, making the SUPERSET 4™ set available for another voice call.

Conditions

- Accessing a private database requires subscription to a database service.
- The PC connects to the same trunk as the SUPERSET 4™ set.
- Once connected to a private database, swapping back to voice mode may or may not result in a disconnect from the private database. To properly disconnect from the database, the database's log-out procedure must be followed before swapping to voice mode.
- The modem line must disconnect from the database before another data call can be made. Attempts to engage in another data call from the SUPERSET 4™ set while the modem line is connected to the database will result in the message "DATA BUSY" being displayed on the SUPERSET 4™ set.
- Data calls can only be set up in the following ways:
    - from a SUPERSET 4™ set using the prime line,
    - from the PC.

Operation

To Access a Private Database **Indirectly** From a SUPERSET 4™ Set:

Part A

- Call the database service Attendant.
- Request a transfer to the database number.
- ANSWER tone is returned from the database's modem.

Part B

- Press the SWAP softkey. Pressing SWAP puts the SUPERSET 4™ set on hold and causes the system to wait for an off-hook condition at the modem line before connecting the call.
- Switch on modem, and put the PC on-line using the commands defined in the communications software package.
- The message "DATA TRANSFER" is displayed on the SUPERSET 4™ set. SWAP and HANG-UP are the only active softkeys.
- The data call is now in progress.

To Access a Private Database **Directly** From the SUPERSET 4™ Set:

Part A

- Directly dial the database directory number.
- ANSWER tone is returned from the database's modem.
- Press the SWAP softkey immediately.

Part B

- Repeat the steps in Part B of accessing a private database **indirectly** from a SUPERSET 4™ set.

To Access a Private Database **Directly** From the PC:

- Program the PC to dial the database access number, followed by the # sign.
- The PC dials the number automatically, places the user's modem in ORIGINATE mode, and connects to the database modem when the database modem returns ANSWER tone.
- The data call to the private database is established. The SUPERSET 4™ set is free to make or receive voice calls.

4.06 ALTERNATING VOICE AND DATA CALL

Description

The user can alternate between a voice call and a data call, using the SUPERSET 4™ set.

Conditions

- When engaged in the data call, the voice call cannot be transferred or conferenced.
- A data call cannot be camped-on.
- Data calls require both the called and calling party to have modem-interfaced PC equipment and communications software.
- Data calls can only be made from a SUPERSET 4™ set using the prime line, or from the PC.

Operation

To Alternate From a Voice to a Data Call:

- Establish a voice call.
- Inform the far-end party that a data call is desired.
- The far-end party puts his or her PC on-line and turns modem on.

  Note: The party initiating the data transfer sets his or her modem to ORIGINATE mode. The opposite party sets his or her modem to ANSWER mode.

- Carrier tone is received. Press the SWAP softkey. DATA TRANSFER message is displayed on SUPERSET 4™ set LCD display.
- Put the PC on-line, and turn on modem in appropriate mode.
- The PCs receive connect messages.
- Send a data file, then press the SWAP softkey. The data call is terminated, and the voice call is re-established.
- By pressing the SWAP softkey again, and turning on modems again, a data call can be re-established.

Notes: 1. If the far-end terminates data transfer by setting his or her modem on-hook, the modem line will go on-hook and transfer control of the call back to the SUPERSET 4™ set in handsfree mode.

2. If the message "DATA BUSY" appears when the set attempts to swap to the modem line, the modem line is already connected to a call, or the modem is attempting to make a data connection. The only active softkey on the SUPERSET 4™ set is CANCEL when "DATA BUSY" appears.

4.07 AUTOMATIC ROUTE SELECTION (ARS)

Description

Automatic Route selection is a software package which directs the PABX to place external calls using the most cost-effective route.

Conditions

- A call dialed by the PC can be routed via ARS, but the dialed number must be followed by either the * character or the # character.
- Refer to Section MITL9105/9110-096-213-NA for further information.

Operation

- Access ARS by using the PC to dial the ARS Access Code, a 7- to 10-digit number, and the * or # character. If * is dialed, the call is transferred to the associated SUPERSET 4™ set. If # is dialed, the PC retains control of the call.
- Refer to Section MITL9105/9110-096-213-NA for further information.

4.08 CALL HOLD AND AUTO-HOLD

Description

These features allow a call to be put on hold in one of two ways: (1) by pressing the red HOLD key, or (2) by pressing any line select key on the SUPERSET 4™ set. Enabling the option "Auto-Hold Disable" in a SUPERSET 4™ set's class-of-service inhibits placing a call on hold by method (2). For data calls, pressing the SWAP softkey places the call on hold until the data call is terminated. A voice call is retrieved from a data call by pressing the SWAP softkey again. The HOLD key cannot put a data call on hold.

Conditions

- Data calls cannot be put on hold using the SUPERSET 4™ set HOLD feature.

Operation

For operation of Call Hold and Auto-Hold, refer to the SUPERSET 4™ Set Features Description in Section MITL9105/9110-096-107-NA.

4.09 DATA CALL

Description

The user can place a call to a PC using either the SUPERSET 4™ set, or the PC.

Conditions

- A data call can be initiated from a SUPERSET 4™ set only by using the prime line.
- A data call can be made to either an internal or external number using the PC.

Operation

To Make A Data Call From the SUPERSET 4™ Set (Internally or Externally):

- Dial a database or PC number from the SUPERSET 4™ set.
- ANSWER tone is returned from the called modem.
- Press the SWAP softkey. "DATA TRANSFER" message is displayed. Press the HANG-UP softkey (returning the receiver on-hook will not hang up the set). If "DATA BUSY" is displayed, press the CANCEL softkey (the HANG-UP softkey does not appear). The SUPERSET 4™ set can now make or receive voice calls in the normal manner.
- Place the PC on-line, and switch on the modem in ORIGINATE mode.
- The PC receives a connect message. The data call is established.

To Make A Data Call From the PC (Internally or Externally):

- Use the PC to dial the remote database or PC number, followed by the # character.
- Place the PC on-line and switch on the modem in ORIGINATE mode.
- The PC receives a connect message. The data call is established.
- The SUPERSET 4™ set can be used to make or receive voice calls in the normal manner.

4.10 MULTIPLE PORT ASSOCIATIONS

Description

One Modem Line can be associated with several SUPERSET 4™ sets. This permits several SUPERSET 4™ set users to access **Associated Modem Line Feature's** data features through a single PC.

Conditions

- During programming of SUPERSET 4™ sets, the same data port is programmed against MODEM EQPT NUMBER for each set.
- Control of a call can be transferred from each set to the PC (although not simultaneously), but the PC can only transfer control of a call to the set having the highest equipment number.
- Refer to Part 5, in this Section.

Operation

- Stations A, B, and C are SUPERSET 4™ sets, and station C has the highest equipment number.
- Modem Line D is shared by the three stations.
- Each station places a voice call and swaps to a data call, in turn.
- Modem Line D dials a voice call number, and swaps the call to the associated voice line.
- Station C has control of the call.

4.11 SIMULTANEOUS VOICE AND DATA CALL (Internal and External)

Description

Associated Modem Line Feature permits a data call and a voice call to be made at the same time. On completion of the voice call, the data call is not affected. Voice calls may be transferred, conferenced, held, etc., with no effect on the data call in progress. If a simultaneous voice and data call is attempted, and the voice line is busy or does not answer, the data call may still proceed. Similarly, if the data line is busy, the voice call may still proceed.

Conditions

- A simultaneous voice and data call uses two trunks or lines. Two trunks in a trunk group must be available before a simultaneous voice and data call can be completed. If two trunks in a group are not available, the user must wait until they become free before a simultaneous call may proceed.

- Data calls can be made from a SUPERSET 4™ set using the prime line only by using the SWAP softkey, or from the PC through the modem line itself.

- If the PC attempts to dial a voice call number with the * character while the associated SUPERSET 4™ set is engaged in a call, the call is dropped, and the seized trunk will be released.

Operation

To Establish a Simultaneous Voice and Data Call from the SUPERSET 4™ Set:

- Dial a data call number, then press the SWAP softkey and then the HANG-UP softkey.

- Place the PC on-line and switch on the modem. The data call is now established.

- Dial a voice call number.

- Near- and far-end PCs are connected. Near- and far-end voice calls are now connected.

To Establish a Simultaneous Voice and Data Call from the PC:

- The PC dials a voice call number followed by the * character. The call is transferred to the SUPERSET 4™ set. The SUPERSET 4™ set is placed in handsfree mode. The modem line is placed in a locked-out condition. Near- and far-end voice calls are now connected.

- The PC goes on-hook for a minimum of 4 seconds, then goes off-hook. The PC dials a data call number. Near- and far-end PCs are connected.

- The two calls progress independently of one another.

Note: SMARTCOM and CROSSTALK do not permit a voice call to be dialed from the PC. If the PC dials a number followed by the * character, the modem will remain connected. The call will not be transferred to the SUPERSET 4™ set.

4.12 SUPERSET 4™ SET CAMP-ON FEATURE

Description

This feature permits the SUPERSET 4™ set user to (1) indicate to a called but busy party that communication is desired, or (2) signal the PABX that a trunk is desired when a Trunk Group is busy, and be connected to a trunk when one becomes free. It also permits the SUPERSET 4™ set user who has received a camp-on signal to answer the camped-on party, or swap between the current party and the camped-on party. Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

Conditions

- The Camp-On feature is active for voice calls only.
- A data call cannot be camped-on.

Operation

Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA for operation of Camp-On.

4.13 SUPERSET 4™ SET PRIVACY/PRIVACY RELEASE

Description

A SUPERSET 4™ set user may have line appearances at his station which are shared with other stations. Unless otherwise selected, privacy is automatic: another station with an appearance of the line the SUPERSET 4™ set user has accessed cannot break into the conversation. If desired, the SUPERSET 4™ set user can permit the intrusion by activating the Privacy Release feature. For further information, refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

Conditions

- When the PRIVACY REL softkey is pressed, the SWAP softkey is no longer displayed (SWAP is no longer available).
- A voice call on which privacy was released cannot swap to a data call.

Operation

Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

4.14 SUPERSET 4™ SET SPEED DIAL

Description

This feature permits the user to program a number to be dialed, on any unassigned SUPERSET 4™ set line key. Data call numbers as well as voice call numbers may be stored as speed dial numbers.

Conditions

Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

Operation

Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

4.15 SUPERSET 4™ SET STATION TRANSFER/CONFERENCE

Description

This feature permits the SUPERSET 4™ set user to transfer a call, or to add more parties to a call. For more information, refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

Conditions

- The Transfer/Conference feature is active for voice calls only. If a SUPERSET 4™ set is engaged in any type of data call, the TRANS/CONF softkey prompt will not appear on the SUPERSET 4™ set features display.

Operation

Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

4.16 SUPERSET 4™ SET SWAP FEATURE

Description

This feature permits the SUPERSET 4™ set user to SWAP between two voice calls (as in Broker's Call), or to alternate between a voice and data call. Refer to the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA for operation of the SWAP feature during voice calls. The SWAP prompt appears at all times during either a voice or data call, except when the message "DATA BUSY" is displayed. Under some conditions, it may be associated with the CAMP-ON prompt during a voice call. Refer to the SWAP CAMP-ON feature in the SUPERSET 4™ Set Features Description, Section MITL9105/9110-096-107-NA.

Conditions

- When **Associated Modem Line Feature's** data features are enabled, the SWAP prompt appears immediately when accessing a trunk or, during an internal call, when the far-end user answers.
- SWAP CAMP-ON is active only on voice calls.

Operation

To Make A Data Call from a SUPERSET 4™ Set Using the SWAP Softkey:

- Establish a voice call, alert the far-end party that a data call is desired, and press the SWAP softkey.
- The SUPERSET 4™ set displays the message "DATA TRANSFER". Control of the call has been passed to the PC. A data call can now be made (refer to Data Call, in this Part).

5. INSTALLATION, PROGRAMMING, AND TESTING OF MODEM LINES

General

5.01 This Part is concerned with configuring the SX-100® or SX-200® PABX when equipped with **Associated Modem Line Feature** to take advantage of the data features. For PABX installation and programming information, refer to the Installation and Programming sections, MITL9105/9110-096-200-NA and MITL9105/9110-096-210-NA.

SUPERSET 4™ Equipment Port/Modem Line Association

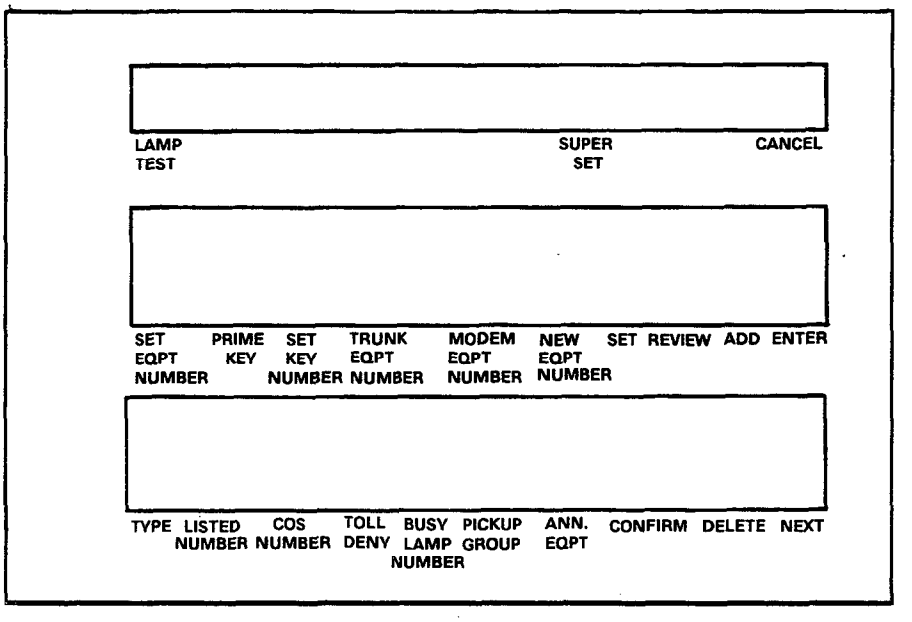
5.02 In **Associated Modem Line Feature**, a SUPERSET® port is associated with a modem line. Data ports are standard tip and ring connections on standard line circuits. Tables 5-1 through 5-3 show the steps for installing and programming **Associated Modem Line Feature**.

TABLE 5-1
INSTALL CONTROL HARDWARE

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>1</td><td>Prepare for new IPC card (9110-203-227-NA):
<table>
<tr><td>IF Installing:</td><td>AND Existing Customer Database is to be:</td><td>THEN:</td></tr>
<tr><td>A New System</td><td>N/A</td><td>Go to Table 5-2</td></tr>
<tr><td rowspan="3">A System Upgrade</td><td>Re-designed</td><td>Go to Step 2</td></tr>
<tr><td>Saved on Paper via Customer Data Print</td><td>Perform Customer Data Print</td></tr>
<tr><td>Saved on Tape via Customer Data Dump</td><td>Perform Customer Data Dump</td></tr>
</table></td></tr>
<tr><td>2</td><td>Turn Control Shelf power OFF.</td></tr>
<tr><td>3</td><td>Replace IPC card with new IPC card (part number 9110-203-227-NA) in Shelf 1, Slot 20.</td></tr>
<tr><td>4</td><td>Turn Control Shelf power ON.</td></tr>
</table>

TABLE 5-2
PROGRAM CUSTOMER DATABASE

<table>
<tr><th>Step</th><th>Directions</th></tr>
<tr><td>1</td><td>Program system customer database per standard procedures:
<table>
<tr><th>IF Installing:</th><th>AND the Customer Database was:</th><th>THEN:</th></tr>
<tr><td>A New System</td><td>N/A</td><td>Program Customer Data</td></tr>
<tr><td rowspan="3">A System Upgrade</td><td>Not Saved</td><td>Program Customer Data</td></tr>
<tr><td>Saved via Customer Data Print</td><td>Program Customer Data</td></tr>
<tr><td>Saved on Tape via Customer Data Dump</td><td>Load Customer Data</td></tr>
</table></td></tr>
<tr><td>2</td><td>Enable COS option 126, for each Class-Of-Service to be assigned to:
- SUPERSET 4™ circuits with an associated data port;
- Station circuits used for modem lines.</td></tr>
<tr><td>3</td><td>Prepare to program SUPERSET 4™ circuits which have associated modem lines.
• Clear SUPERSET® programming by initializing data block 2 (refer to Volume 3, PN 9110-090-003-NA).
• Equipment numbers for SUPERSET 4™ circuits with associated modem lines must be in the range 009 - 256.</td></tr>
<tr><td>4</td><td>Access SUPERSET 4™ Extended Programming Mode.
• Refer to Figure 5-1 for SUPERSET 4™ Extended Programming Overlay.
• Press SET EQPT NUMBER, then enter the SUPERSET 4™ set equipment number.
• Press PRIME KEY.
• Press MODEM EQPT NUMBER, then enter the equipment number of the Associated Modem Line, or press DELETE (as required). Press ENTER.
• Complete SUPERSET 4™ programming (refer to Section MITL9105/9110-096-210-NA).</td></tr>
<tr><td>5</td><td>If more SUPERSET 4™ sets are to be programmed, repeat Step 4.
• Assigned COS must have COS option 126 (ASSOCIATED DATA PORT) enabled.</td></tr>
<tr><td>6</td><td>Program a station line circuit for each modem line.
• Valid MODEM LINE equipment numbers are in the range of 002-256.
• Assigned COS must have COS option 126 (ASSOCIATED DATA PORT) enabled.</td></tr>
</table>



KA0114R0E0

Figure 5-1 SUPERSET 4™ Set Extended Programming Overlay

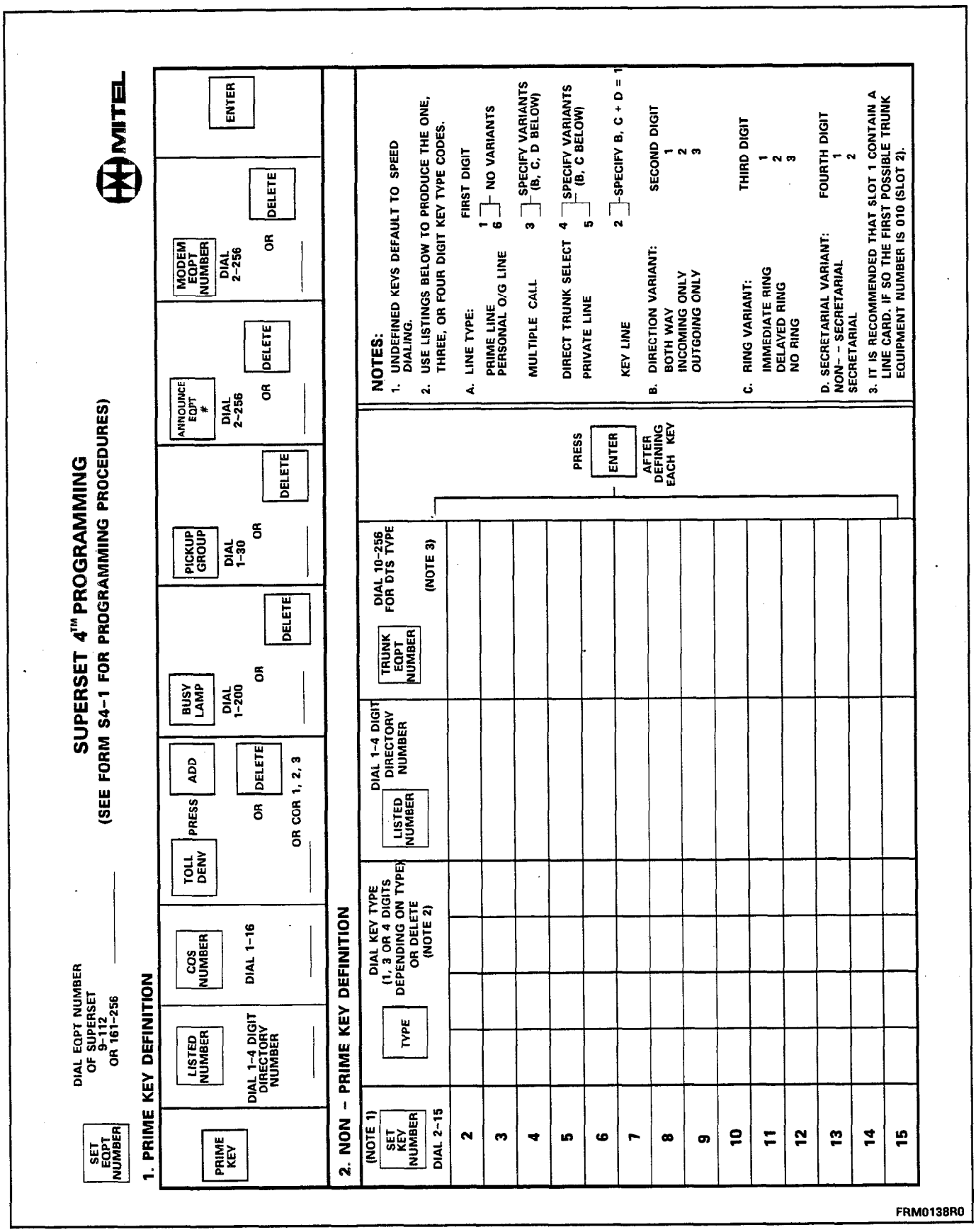
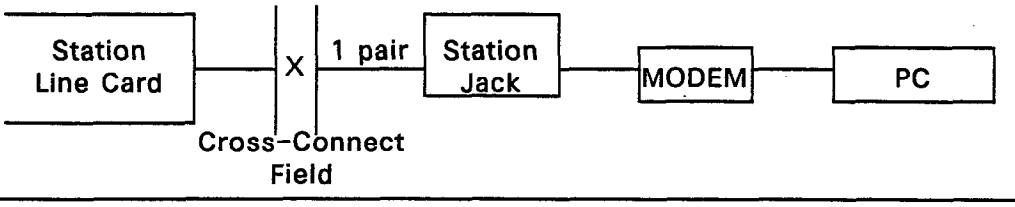


Figure 5-2 SUPERSET 4™ Set Programming Form

TABLE 5-3
INSTALL STATION HARDWARE

Step	Directions
1	Verify that each Station Line circuit used for a MODEM LINE has a valid equipment number, and install a Line Circuit card as required.
2	Connect Station Jacks for Modem Lines to assigned Station Line Circuits using 1 pair of connection wires. 

Wiring Considerations

5.03 Each modem line associated with a SUPERSET 4™ set requires an additional modular jack and wiring running from the jack to the PABX data port, not physically tied to the SUPERSET 4™ set station in any way.

Programming Considerations

5.04 The PABX must be programmed to enable **Generic 217** data capabilities and features (**Associated Modem Line Feature**). Table 5-4 lists the relevant programming options to be enabled in **Associated Modem Line Feature**. Options are enabled by setting the appropriate field to the necessary value. Refer to the Programming section, MITL9105/9110-096-210-NA, for details regarding system programming.

5.05 Data ports are associated with SUPERSET 4™ sets during SUPERSET® set programming. Access SUPERSET® set Extended Programming mode, and follow the steps outlined in Table 5-2. Ensure that each modem line is also assigned a station number, and that the COS of the modem lines has Option 126 enabled.

5.06 A SUPERSET 4™ set not associated with a modem line can be programmed to have a modem line as a key line appearance. This permits several SUPERSET 4™ set users to have line appearances of various modem lines, and is useful in situations where one data device is to be shared among several data users, as in "printer pooling".

5.07 Modem Lines and SUPERSET 4™ sets may be placed in Hunt Groups, but SUPERSET 4™ sets and their Associated Modem Lines should not be in the same Hunt Groups. Hunt Groups may be used with data devices such as printers. Several printers can be placed in a single Hunt Group. When a PC attempts to place a call to the Hunt Group, the first free printer will be connected to the PC.

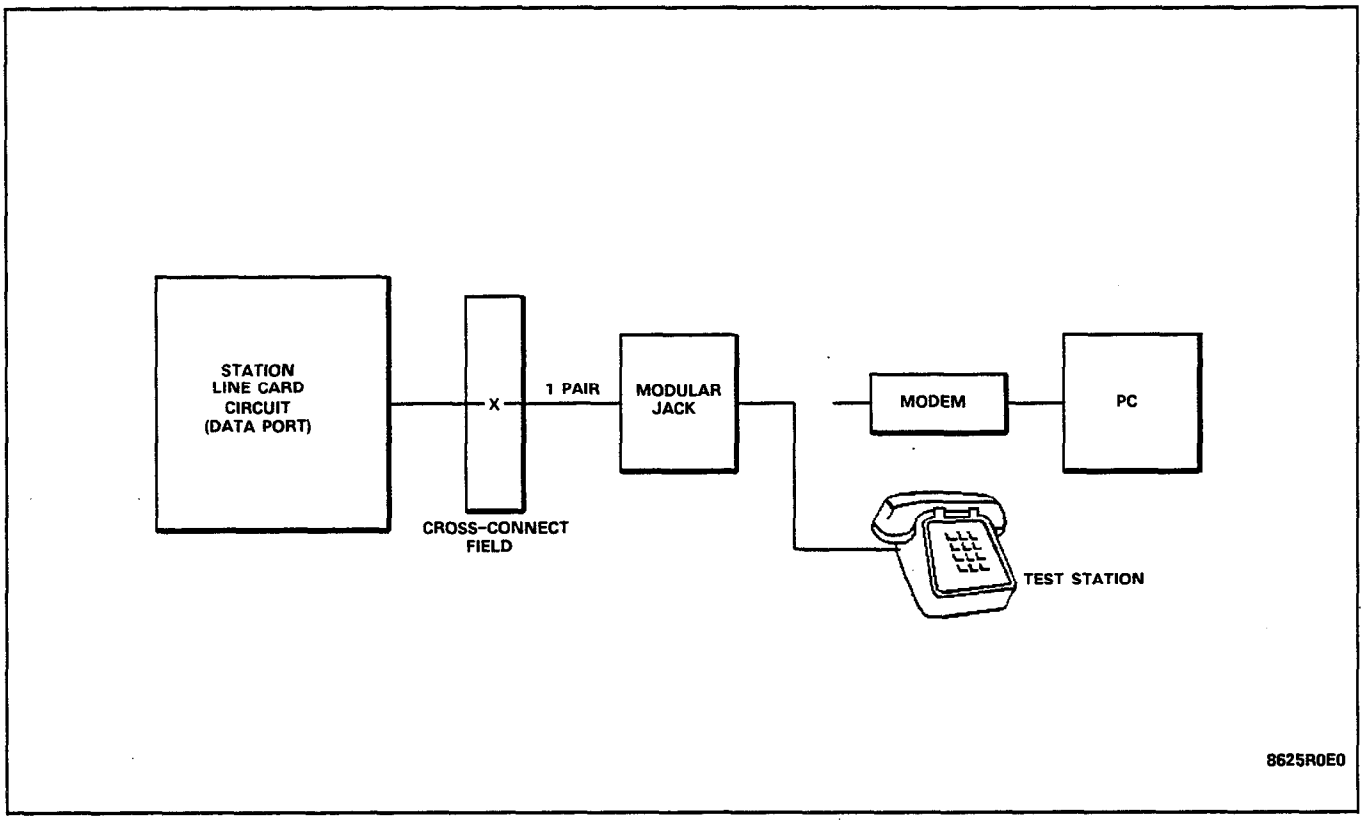


Figure 5-3 Test Equipment Setup

5.08 One modem line may be shared by several SUPERSET 4™ sets. During SUPERSET® set programming, the same data port equipment number is entered against each SUPERSET 4™ programmed.

Testing

5.09 The following tests verify that the PABX data features operate correctly. For these tests, an industry-standard telephone is connected to the modem line. The PC and modem are not connected.

5.10 Ensure the PABX is operating under **Generic 217**. Ensure that Customer Data programming has been completed, and that the Class-of-Service of the SUPERSET 4™ set and modem line has COS Option 126 enabled.

5.11 Connect a test extension (standard telephone) to the station jack of the MODEM LINE to be tested, as shown in Figure 5-3.

5.12 Use Tables 5-5 through 5-9 to test MODEM LINE operation. Place voice and data calls to ensure the features operate correctly. If the SUPERSET 4™ set or test set does not respond correctly, refer to Part 6 of this Practice.

TABLE 5-4
ASSOCIATED MODEM LINE FEATURE PROGRAMMING OPTIONS

PABX	OPTION NAME AND TYPE	STATUS	OPTION NUMBER	SEE NOTE
SX-100 SX-200	ASSOCIATED MODEM LINE (COS OPTION)	ENABLE	OPTION NUMBER 126	1, 2
	TRUNK GROUP ACCESS (COS OPTIONS)	AS REQUIRED	OPTIONS 65 - 76	3

NOTES: 1. (a) If the Class-of-Service of the modem line is different from that of the associated SUPERSET 4™ set, this option must be set for both Classes-of-Service.

(b) This option conflicts with COS Option 41 ("Data Security"), and COS Option 101 ("Earth Ground Button").

(c) Enabling this option gives the associated modem line data security automatically; the SUPERSET 4™ set will NOT have data security.

2. (a) SX-100®/SX-200® COS Option 126 disables Option 99 ("Handsfree Station") in some cases.

(b) COS Option 126 sets COS Option 46 ("Flash Disable") for all stations.

(c) If COS Option 126 and COS Option 40 ("Executive Busy Override") are enabled, modems can override SUPERSET 4™ sets; SUPERSET 4™ sets can override SUPERSET 4™ sets; but modems cannot be overridden.

(d) A Modem Line should not be programmed into the same Hunt Group as its associated SUPERSET 4™ set.

3. If COS Option 127 ("DISA At Night") is enabled, the selected Trunk will be considered a DISA Trunk while in Night Service only. During Day Service, the Trunk will operate normally.

TABLE 5-5
TEST ALTERNATING VOICE AND DATA CALL

Step	Action	Verification
1	Place a call from the SUPERSET 4™ set associated with the MODEM LINE to a trunk or extension number.	"SWAP" softkey is displayed on SUPERSET 4™ set LCD display. **NOTE:** SWAP appears during an internal call once the called extension answers.
2	Press "SWAP" softkey to transfer the call to the MODEM LINE.	Call is transferred to MODEM LINE station. "DATA TRANSFER" is displayed on SUPERSET 4™ set LCD display.
3	Press "SWAP" softkey to transfer the call to the SUPERSET 4™ SET.	Call is transferred to SUPERSET 4™ set. "SWAP" softkey is displayed on SUPERSET 4™ set LCD display.
4	Press "SWAP" softkey to transfer the call to the MODEM LINE.	Call is transferred to DATA PORT station. "DATA TRANSFER" is displayed on SUPERSET 4™ set LCD display.
5	Set the MODEM LINE extension on-hook.	Call is transferred to the SUPERSET 4™ set. "SWAP" softkey is displayed on SUPERSET 4™ set LCD display.
6	Press the SUPERSET 4™ set HANG-UP softkey.	SUPERSET 4™ set and MODEM LINE station idle. Test completed.

TABLE 5-6
TEST SIMULTANEOUS VOICE AND DATA CALLS

Step	Action	Verification
1	Place a call FROM the SUPERSET 4™ set associated with the MODEM LINE TO a trunk or extension number.	"SWAP" softkey is displayed on SUPERSET 4™ set LCD display. **NOTE:** SWAP appears during an internal call once the called extension answers.
2	Press the SUPERSET 4™ set SWAP softkey.	"DATA TRANSFER" is displayed on SUPERSET 4™ set LCD display.
3	Press 'HANG-UP' softkey on the SUPERSET 4™ set.	SUPERSET 4™ set LCD display returns to idle display.
4	Place a call from the SUPERSET 4™ set to a third extension.	Voice connection established.
5	Hang up the SUPERSET 4™ set.	SUPERSET 4™ set idle.
6	Place the MODEM LINE extension on-hook.	MODEM LINE extension idle. Test completed.

TABLE 5-7
TEST DATA CALL FROM MODEM LINE

Step	Action	Verification
1	Place a call FROM the MODEM LINE extension to a second extension; follow the dialed number with a #.	Connection established. SUPERSET 4™ set remains idle.
2	Place the MODEM LINE extension on-hook.	MODEM LINE extension idle. Test completed.

TABLE 5-8
TEST VOICE CALL FROM MODEM LINE

Step	Action	Verification
1	Place a call FROM the MODEM LINE extension to a trunk or extension; follow the dialed number with a *.	Destination is dialed. The call is transferred to the SUPERSET 4™ set. The SUPERSET 4™ set is placed in HANDSFREE mode. MODEM LINE extension is locked out.
2	Place the MODEM LINE extension on-hook.	SUPERSET 4™ set is connected to the trunk or extension.
3	Hang up the SUPERSET 4™ set.	SUPERSET 4™ set is idle. Test completed.

TABLE 5-9
TEST DATA CALL TO MODEM LINE

Step	Action	Verification
1	Place a call TO the MODEM LINE extension from a second extension.	MODEM LINE extension rings.
2	Answer call at MODEM LINE extension.	Connection established.
3	Place the second extension on-hook.	MODEM LINE extension locked out.
4	Place the MODEM LINE extension on-hook.	Test completed.

6. TROUBLESHOOTING

General

6.01 This Part is intended to provide a systematic approach to troubleshooting problems which may be encountered during operation of the data features of **Associated Modem Line Feature**. It is not intended to replace the Troubleshooting section for the SX-100® and SX-200® PABXs. Rather, this Part reflects only those aspects of troubleshooting not specifically covered elsewhere.

6.02 This Part assumes that the PABX has been installed correctly and operates properly for all extension and console features. It assumes all cards in the PABX not relating to **Associated Modem Line Feature** are functioning.

TABLE 6-1
SUPERSET 4™ SET FAULTS

FAULT	STEP	ACTION
SUPERSET 4™ set display is blank; switchhook is inoperative.	(A) Check SUPERSET 4™ set cord and modular connectors.	Replace cord.
	(B) Check SUPERSET 4™ set equipment number, tip and ring connections, and SUPERSET® Line Card.	Correct as necessary.
	(C) Check that a data call can be made. If so, then swap the SUPERSET 4™ set with a SUPERSET 4™ set which is known to work. If new SUPERSET 4™ set works, original set was faulty.	Go to (D).
	(D1) Check SUPERSET 4™ set terminates at a SUPERSET® Line Card, not an 8-Station Line Card. If the SUPERSET 4™ set is connected to a standard equipment port:	Go to (D2).
	(D2) Check the associated modem line wall jack. If the modem line wall jack terminates at a SUPERSET® equipment port: connections at wall jacks are reversed.	Switch SUPERSET 4™ set and associated data plugs at wall jacks.

TABLE 6-1 (CONT'D)
SUPERSET 4™ SET FAULTS

FAULT	STEP	ACTION
SUPERSET 4™ set blank display (cont'd).	(D3) If cards are installed correctly, connections at wall jacks are reversed.	Switch SUPERSET 4™ set and associated modem line plugs at wall jack.
	(D4) If modem line is properly connected to a line card, but SUPERSET 4™ is also connected to an 8-Station Line Card, an incorrect card has been installed.	Swap the line card to which the SUPERSET 4™ set connects, with a SUPERSET® Line Card.
Cannot SWAP to a data call from a voice call.	(A) Check modem line equipment number has not been busied out.	Return modem line equipment number to un-busy condition.
	(B) External call: Check modem line equipment number is not denied access to Trunk Group.	Re-program PABX to permit Trunk Group access.
	(C) Check COS of SUPERSET 4™ set includes COS Option 126.	Re-program PABX to enable COS Option 126 in the SUPERSET 4™ set class-of-service.
	(D) Check modem line line card or circuit operation.	Replace line card.
Cannot SWAP from a data call to a voice call, but SUPERSET 4™ set is otherwise functional	(A) Check SUPERSET 4™ set equipment number has not been busied out.	Return SUPERSET 4™ set to an un-busy condition.
	(B) Check that Privacy is enabled on the SUPERSET 4™ set.	Enable Privacy on the SUPERSET 4™ set by pressing PRIVACY REL CANCEL softkey.

TABLE 6-2
DATA CALL FAULTS

FAULT	STEP	ACTION
Cannot make a data call, but SUPERSET 4™ set operates properly.	(A) Check modem connection to wall jack; check connecting cord.	Replace cord.
	(B) Check data call destination number, database access number.	Report problem to destination.
	(C) Check modem, computer equipment, and software, and ensure compatibility.	Correct as necessary.
	(D) Check modem line equipment number, line card or port, tip and ring connections, and equipment number programming to ensure data calls are not restricted or excluded from SUPERSET 4™ set user's class-of-service.	Correct as necessary.
Cannot receive a data call, but SUPERSET 4™ set operates properly.	(A) Check modem line line card or port, and ensure modem line has not been busied-out.	Return modem line line card to service.
	(B) Check modem line line card for functionality.	Replace line card.
	(C) Check modem, computer equipment, and software, and compatibility with Associated Modem Line Feature.	Correct as necessary.
Modem ANSWER tone and carrier are audible, but modem does not detect carrier. Modem does not provide a READY indication.	Return to on-hook condition, and re-try.	Modem fault. Refer to modem manual. If necessary, replace modem.

7. MAINTENANCE

General

7.01 The **Associated Modem Line Feature** system requires no special maintenance apart from the previous Generics for the respective PABXs. For maintenance information, refer to the Maintenance section, MITL9105/9110-096-500-NA.