SX-100®
SX-200®

SUPERSWITCH®

VOLUME I

GENERIC ACD

MITEL

PN 9110-090-001-NA

SX-200

WARNING

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

SX-100

WARNING

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SX-100®/SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION SYSTEM
DOCUMENTATION INDEX

1. GENERAL

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

2. DOCUMENTATION INDEX

2.01 The complete set of Practices are contained in two 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.

2.02 Sections commencing with MITL9105- and MITL9110- contain information specific to the SX-100/SX-200 Systems respectively, while those commencing with MITL9105/9110- embrace both types of Systems.

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VOLUME I	
Section No.	**Title**
MITL9105/9110-090-000-NA	Documentation Index
MITL9105/9110-090-100-NA	General Description
MITL9105/9110-090-105-NA	Feature and Services Description
MITL9105/9110-090-106-NA	Feature and Services Description
MITL9105/9110-090-107-NA	Feature and Services Description
MITL9105/9110-090-150-NA	Physical Description and Ordering Information
MITL9105/9110-090-180-NA	Engineering Information
MITL9105/9110-090-212-NA	Multi-Digit Toll Control
MITL9105/9110-090-213-NA	Automatic Route Selection
MITL9105/9110-090-220-NA	Speed Call
MITL9105/9110-090-222-NA	Automatic Call Distribution Description
MITL9105/9110-090-315-NA	Attendant Console Description
MITL9105/9110-090-450-NA	Traffic Measurement
MITL9105/9110-090-451-NA	Station Message Detail Recording
MITL9105/9110-090-500-NA	General Maintenance Information
VOLUME II	
Section No.	**Title**
MITL9105/9110-090-000-NA	Documentation Index
MITL9105/9110-090-200-NA	Shipping, Receiving and Installation
MITL9105/9110-090-210-NA	System Programming
MITL9105/9110-090-215-NA	Installation Test Procedures
MITL9105/9110-090-320-NA	Extension Test Procedures
VOLUME III	
INSTALLATION FORMS	
VOLUME IV	
Section No.	**Title**
MITL9105/9110-090-350-NA	Troubleshooting

SX-100® / SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION SYSTEM
GENERAL DESCRIPTION

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and SUPERSET 4 are Trademarks of MITEL Corporation

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1. GENERAL

Introduction

1.01 This Section contains a brief description of the SX-100/SX-200 Automatic Call Distribution Systems, the SUPERSET 4 and the SUPERSET 3. This Section also provides brief physical and electrical descriptions, together with the installation and maintenance considerations. For complete details, refer to the required practice as listed in Table 1-1.

TABLE 1-1
PRACTICE INDEX

Section No.	Title
VOLUME 1	
MITL9105/9110-090-000-NA	Documentation Index
MITL9105/9110-090-100-NA	General Description
MITL9105/9110-090-105-NA	Feature and Services Description
MITL9105/9110-090-150-NA	Physical Description and Ordering Information
MITL9105/9110-090-180-NA	Engineering Information
MITL9105/9110-090-212-NA	Multi-Digit Toll Control
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MITL9105/9110-090-215-NA	System Test Procedures
MITL9105/9110-090-320-NA	Extension Test Procedures
VOLUME III	
INSTALLATION FORMS	
VOLUME IV	
Section No.	**Title**
MITL9105/9110-090-350-NA	Troubleshooting

Reason for Issue

1.02 This Section has been issued to provide a general description of the SX-100/SX-200 Automatic Call Distribution Systems, the SUPERSET 4 and the SUPERSET 3.

SUPERSET 4, SUPERSET 3 and Automatic Call Distribution

1.03 For feature information on the SUPERSET 4, see Section MITL 9105/9110-090-107-NA. For feature information on the SUPERSET 3, see Section MITL9105/9110-090-106-NA. For a brief description of the SUPERSET 4 and the SUPERSET 3 see Part 6. For a description of the Automatic Call Distribution feature see Section MITL 9105/9110-090-222-NA. For a brief description see Part 5 of this Section.

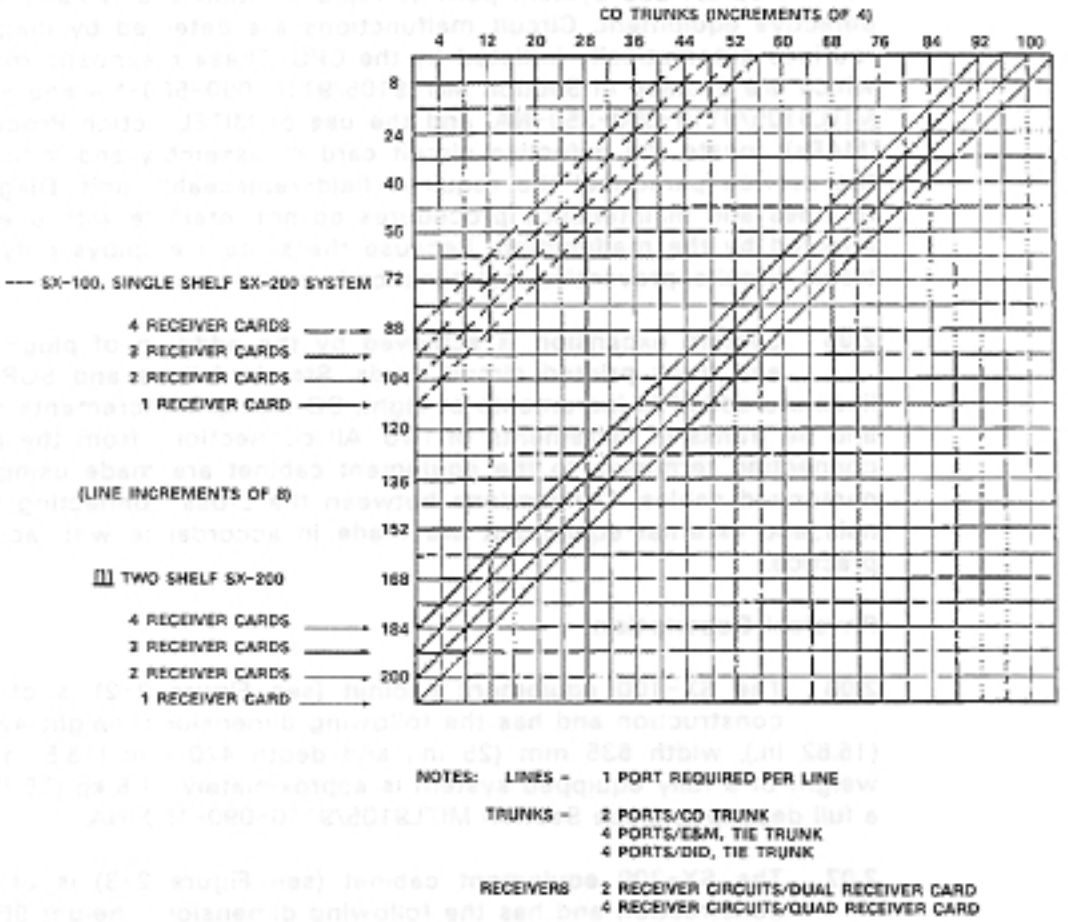
2. SYSTEM GENERAL DESCRIPTION

Introduction

2.01 The SX-100/SX-200s are advanced Automatic Call Distribution (ACD) Systems employing digitally controlled solid-state space-division switching and stored program control. The SX-100 has a capacity of 160 ports. One hundred and twelve of these ports are available for assignments to standard lines, trunks and additional receivers. The remaining 48 ports are reserved for common control functions. The SX-200 has a capacity of 256 ports. Two hundred and eight of these ports are available for assignments to lines, trunks and additional receivers. The remaining 48 ports are reserved for common control functions. Figure 2-1 shows the maximum standard line and trunk configuration. When the SX-100/SX-200 is used with the SUPERSET 4 or SUPERSET 3, a maximum of 64 SUPERSETs may be used (each SUPERSET requires one port). The SUPERSET requires a SUPERSET Line card (eight SUPERSETs per card). Standard telephone sets are not compatible with the SUPERSET Line card. The remaining card slots can be assigned to standard telephones or may be used for lines, trunks and additional receivers as required. The SX-100/SX-200 are electrically compatible with most existing extension, key-telephone, Private Branch Exchange (PBX) and Central Office (CO) equipment, and provide:

- Automatic Call Distribution (ACD)
  - the use of a flexible numbering plan,
  - the simultaneous use of DTMF and rotary dial stations,
  - optional use of Supervisor Consoles - two maximum,
  - extensive selection of standard and optional features,
  - freedom from scheduled maintenance,
  - automatic diagnostics,
  - six power failure transfer circuits - SX-100,
  - 12 power failure transfer circuits - SX-200,
  - free-standing or wall-mounting cabinet - SX-100,
  - free-standing cabinet - SX-200,
  - optional reserve power supply, and use of SUPERSET 4 and or SUPERSET 3.

2.02 The SX-100/SX-200 consists of a single cabinet (containing the switching circuitry and the system power supplies) and a desk-type Supervisor Console equipped with pushbutton dial pad and control keys. Connections between the equipment cabinet, the consoles, and the distribution frame are made using connectorized 25-pair ca-



NOTES: LINES – 1 PORT REQUIRED PER LINE

TRUNKS – 2 PORTS/CO TRUNK
4 PORTS/E&M, TIE TRUNK
4 PORTS/DID, TIE TRUNK

RECEIVERS 2 RECEIVER CIRCUITS/DUAL RECEIVER CARD
4 RECEIVER CIRCUITS/QUAD RECEIVER CARD

X02R4

Figure 2-1 Maximum Line and Trunk Configuration

bles. The SUPERSETs come equipped with a modular-type male telephone plug that may be plugged into a standard modular receptacle, which is wired to the distribution frame.

2.03 Noiseless operation, exceptionally small size and environmental tolerance allow a wide choice of locations for the equipment cabinet, the SUPERSET 3 or SUPERSET 4.

Maintenance

2.04 The modular design and functional packaging of the SX-100/SX-200 system permits rapid location and replacement of defective equipment. Circuit malfunctions are detected by diagnostic routines automatically initiated by the CPU. These diagnostic routines, which are detailed in Section MITL9105/9110-090-500-NA and Section MITL9105/9110-090-350-NA, and the use of MITEL Action Procedures (MAPs); locate the defective circuit card or assembly and indicate to the service personnel the required field-replaceable unit. Diagnostic routines and maintenance procedures do not interfere with users not affected by the malfunction. Because the system employs only electronic circuits, preventive maintenance is not required.

2.05 System expansion is achieved by the addition of plug-in line and trunk printed circuit cards. Standard lines and SUPERSET lines are added in increments of eight, CO trunks in increments of four and tie trunks in increments of two. All connections from the cross-connecting terminals to the equipment cabinet are made using connectorized cables. Connections between the cross-connecting terminals and external equipment are made in accordance with accepted practice.

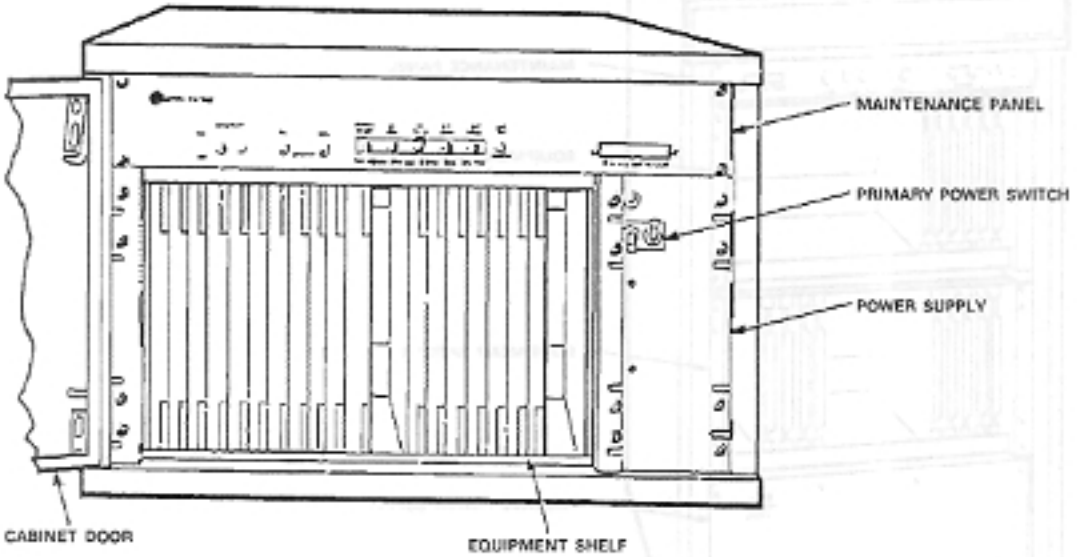
Physical Description

2.06 The SX-100 equipment cabinet (see Figure 2-2) is of metal construction and has the following dimensions: height 422 mm (16.62 in.), width 635 mm (25 in.) and depth 470 mm (18.5 in.). The weight of a fully equipped system is approximately 31.8 kg (70 lb). For a full description, see Section MITL9105/9110-090-150-NA.

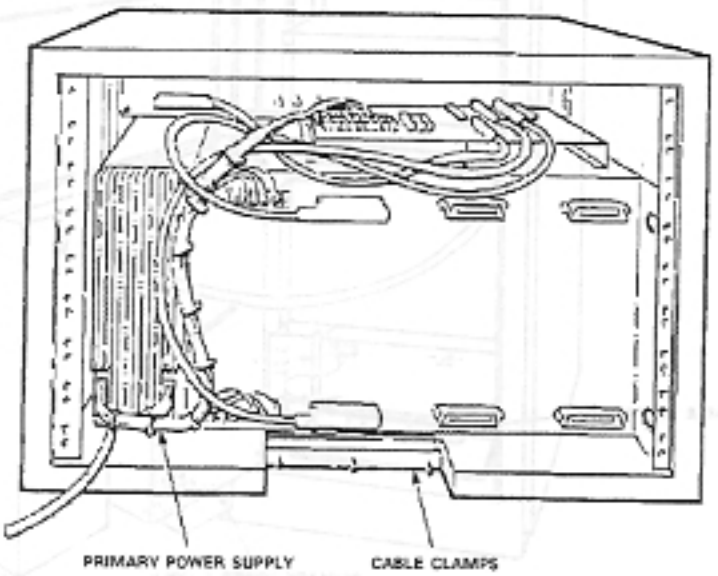
2.07 The SX-200 equipment cabinet (see Figure 2-3) is of metal construction and has the following dimensions: height 960 mm (38 in.), width 600 mm (23.5 in.) and depth 700 mm (27.5 in.). The weight of a fully equipped system is approximately 131.7 kg (290 lb). For a full description, see Section MITL9105/9110-090-150-NA.

Equipment Cabinet

2.08 The door on the front of the cabinet provides access to the system maintenance panel and the printed circuit cards. In the SX-100 a removable rear panel provides access to the system power supply, and the line and trunk connections. In the SX-200 a hinged lockable rear panel provides access to the system power supply, and the line and trunk connections. Cable entry to the equipment cabinet is provided through a cable duct in the rear of the cabinet. The equip-



FRONT VIEW



REAR VIEW

WEIGHT	HEIGHT	WIDTH	DEPTH
31.8 kg (70 lb)	422 mm (16.62 in.)	635 mm (25.0 in.)	470 mm (18.5 in.)

X5611

Figure 2-2 SX-100 Equipment Cabinet

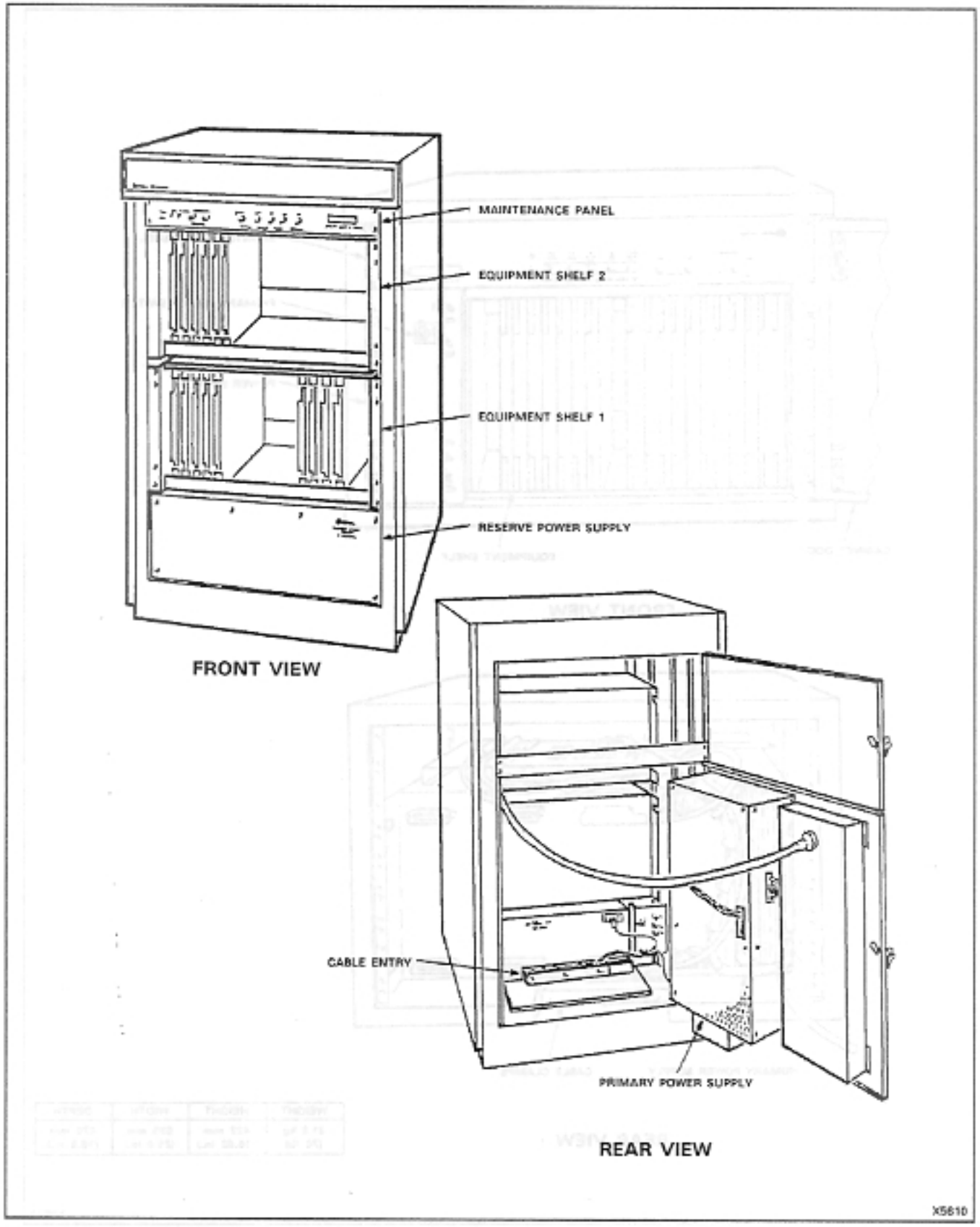


Figure 2-3 SX-200 Equipment Cabinet

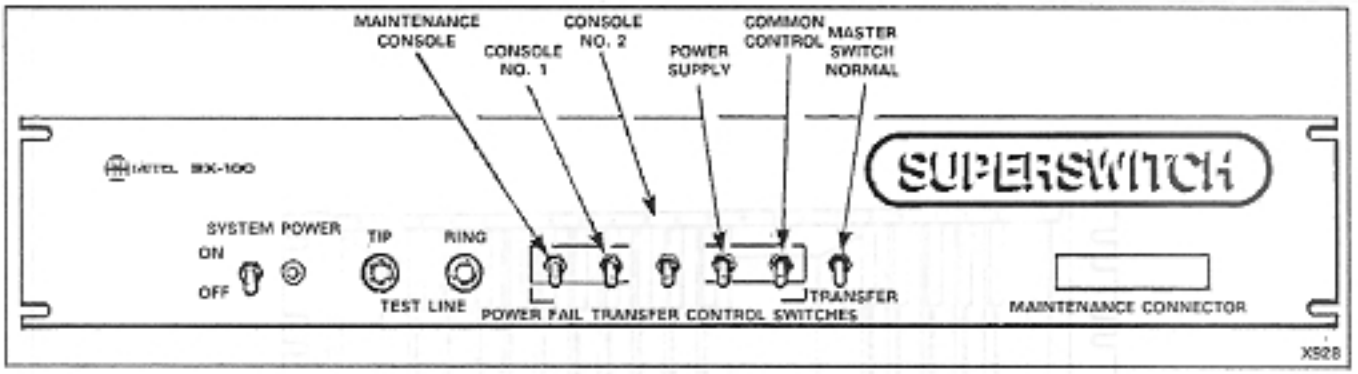


Figure 2-4 SX-100 Maintenance Panel

ment cabinet holds the maintenance panel, the equipment shelf, the printed circuit cards and the primary power supply. In addition a reserve power supply may be mounted in the bottom of the SX-200 or form a pedestal for the the SX-100.

Maintenance Panel

2.09 The maintenance panel (Figure 2-4), mounted at the top of the cabinet, provides access to the system from the Maintenance Console through a 50-pin connector. To the left of the maintenance plug is the master power failure transfer switch and five power fail transfer control switches. In addition, a test line is provided which allows service personnel to access individual lines and trunks.

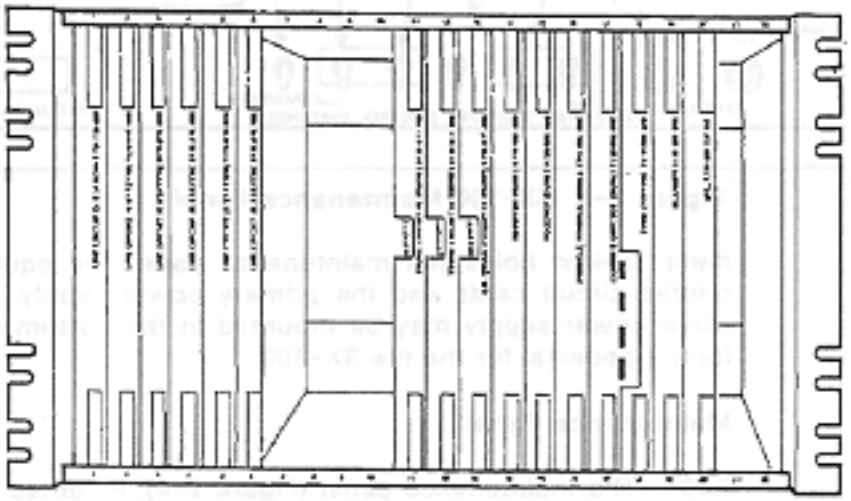
Equipment Shelf

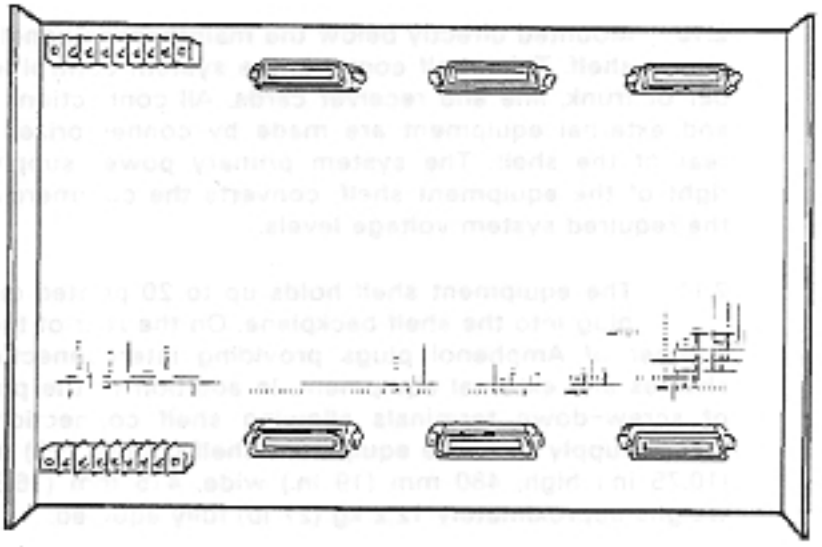
2.10 Mounted directly below the maintenance panel is the equipment shelf. This shelf contains the system control logic plus a number of trunk, line and receiver cards. All connections between shelves and external equipment are made by connectorized cables from the rear of the shelf. The system primary power supply, located to the right of the equipment shelf, converts the commercial input power to the required system voltage levels.

2.11 The equipment shelf holds up to 20 printed circuit cards which plug into the shelf backplane. On the rear of the backplane are a number of Amphenol plugs providing interconnections between the shelves and external equipment. In addition to the plugs are a number of screw-down terminals allowing shelf connection to the primary power supply unit. The equipment shelf (Figure 2-5) measures 273 mm (10.75 in.) high, 480 mm (19 in.) wide, 415 mm (16.375 in.) deep and weighs approximately 12.2 kg (27 lb) fully equiped.

Printed Circuit Cards

2.12 All circuit cards (Figure 2-6) within the system are identical in construction and consist of a fiberglass board with printed wiring patterns on both of its faces. Riveted to the front of each board is a transparent faceplate which allows the LEDs mounted on the front of the boards to be easily seen. The color-coded card extractors





X5812

Figure 2-5 Equipment Shelf

located at the top and bottom of the faceplate identify the card position within a shelf and ensure that the card is seated correctly in the backplane connector.

SX-100 Primary Power Supply

2.13 The system primary power supply (total weight 6.8 kg (15 lb)) is mounted to the right of the equipment shelf (see Figure 2-2). It provides all system power from 115 Vac, 48 Hz to 64 Hz commercial power supply. With a special 230 Vac adapter, the SX-100 may be operated from 230 Vac 48 Hz to 64 Hz.

SX-200 Primary Power Supply

2.14 The system primary power supply (total weight 32 kg (70 lb)) is mounted directly on the cabinet back panel (see Figure 2-3). It provides all system power from 115 Vac or 230 Vac, 48 Hz to 64 Hz commercial power supply.

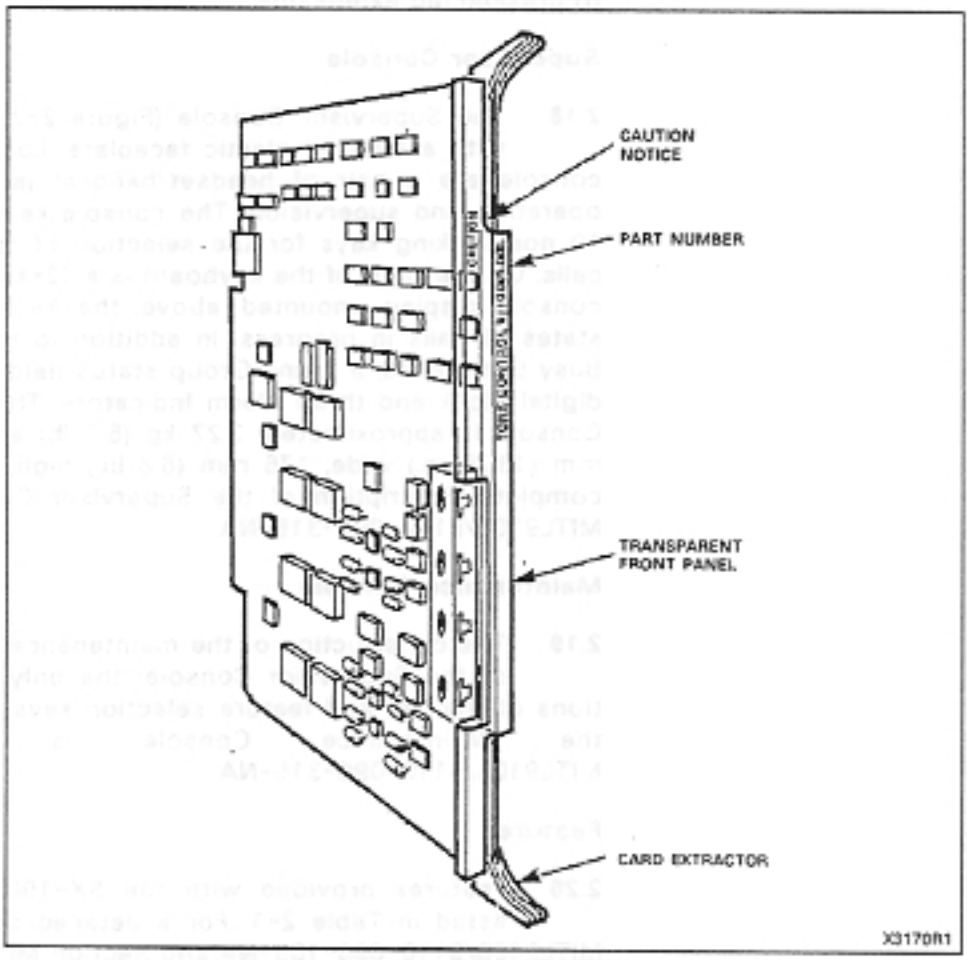


Figure 2-6 Typical Printed Circuit Card

Reserve Power Supply

2.15 The reserve power supply is designed to maintain complete system operation for a minimum of two hours in the event of a commercial power failure. The batteries and the charger are enclosed in a metal casement that forms a pedestal for the SX-100 equipment cabinet, weighing a total of 56.7 kg (125 lb). The SX-200 reserved power supply batteries are housed in a completely enclosed shelf measuring 180 mm (7 in.) high, 480 mm (19 in.) wide, 370 mm (14.5 in.) deep and weighing approximately 56.7 kg (125 lb) and is mounted in the bottom of the SX-200 cabinet.

Electrical Characteristics

2.16 The electrical characteristics of the SX-100/SX-200 are listed in Table 2-2.

2.17 The SX-100/SX-200 ACD Systems are designed to operate from a 48 Vdc source. This can be provided by the customer from a suitable source of 48 Vdc. In the event of a power failure with no reserve power available, the SX-100 can be arranged to automatically connect up to six Central Office trunks to preselected extensions. The SX-200 can be arranged to connect up to 12 Central Office trunks to preselected extensions.

Supervisor Console

2.18 The Supervisor Console (Figure 2-7) is enclosed in a housing with a smoked plastic faceplate. Located on either side of the console are a pair of headset/handset jacks allowing simultaneous operation and supervision. The console keyboard holds three rows of 10 non-locking keys for the selection of features and completion of calls. On the right of the keyboard is a 12-key pushbutton dial pad. The console display, mounted above the keyboard, displays the active states of calls in progress. In addition to the Call Status Display is a Busy Lamp Field, a Trunk Group status field, a Call Waiting Indicator, a digital clock and three Alarm Indicators. The weight of the Supervisor Console is approximately 2.27 kg (5.0 lb) and its dimensions are: 350 mm (13.75 in.) wide, 176 mm (6.8 in.) high, 236 mm (9.25 in.) deep. A complete description of the Supervisor Console is given in Section MITL9105/9110-090-315-NA.

Maintenance Console

2.19 The construction of the maintenance console is identical to that of the Supervisor Console; the only difference is in the functions of the call and feature selection keys. A complete description of the Maintenance Console is given in Section MITL9105/9110-090-315-NA.

Features

2.20 Features provided with the SX-100/SX-200 ACD System are listed in Table 2-1. For a detailed description refer to Section MITL9105/9110-090-105-NA and Section MITL9105/9110-090-222-NA.

Feature Provisioning

2.21 All extension features provided by the SX-100/SX-200 may be grouped into different Classes of Service, each Class of Service (a maximum of 16) may contain any mixture of features. Feature installation consists of entering into the system memory the number of the extension to which the features are to be assigned, followed by the required Class-of-Service code. All data entries into the system may be made from the Supervisor or Maintenance Console. To prevent the loss of customer data in the event of a power failure, the memory holding the data associated with each line or trunk is equipped with its own reserve power supply. This power supply is sufficient to maintain the memory intact for a period of four weeks.

3. SYSTEM OPERATION

3.01 The SX-100/SX-200s are solid-state ACD Systems employing space-division switching and microprocessor control of call processing. A block diagram of the system is shown in Figure 3-1. The SX-100 has a capacity of 112 ports and the SX-200 has a capacity of 208 ports, which may be assigned to receivers, lines, and trunks. The

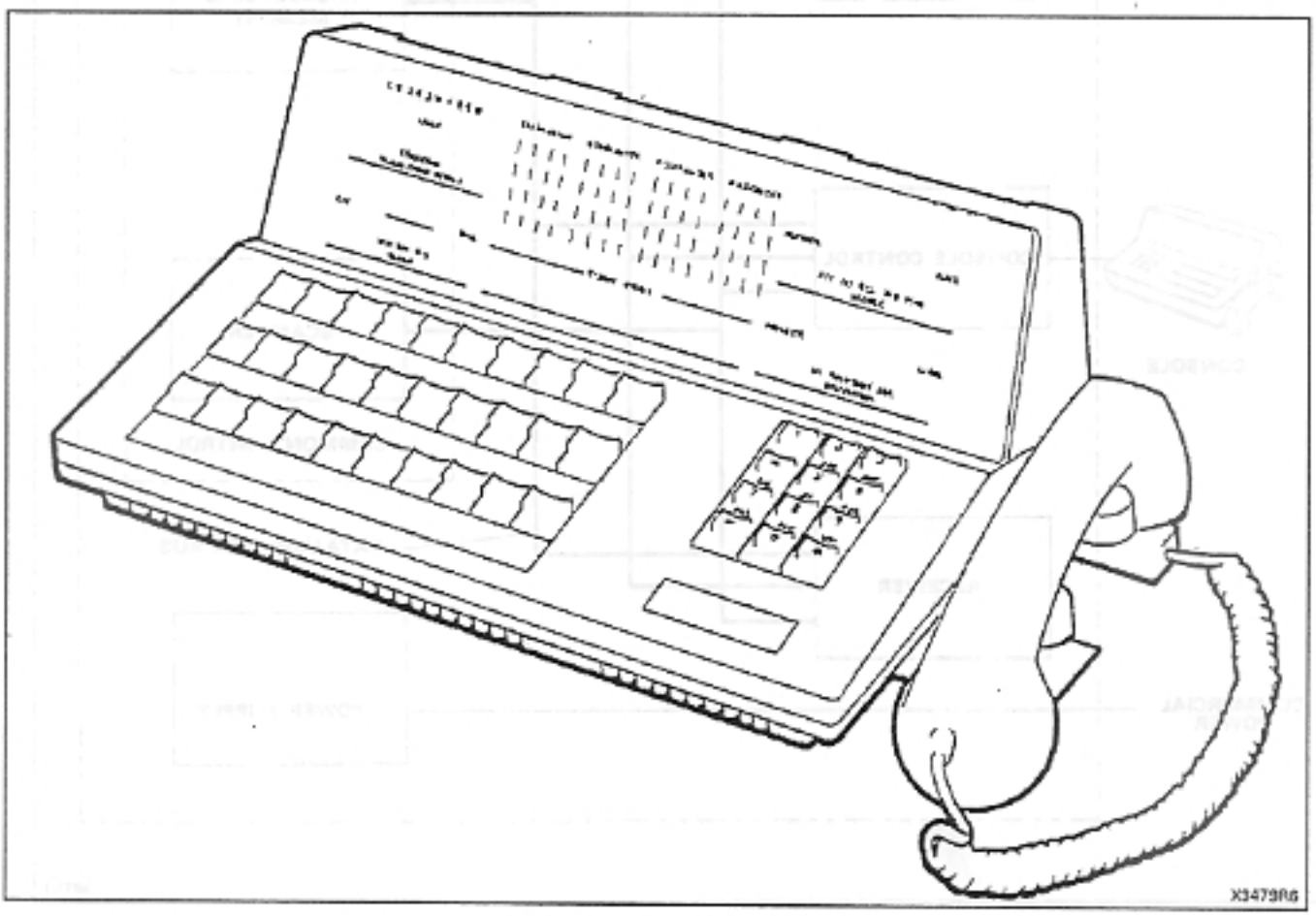


Figure 2-7 Supervisor Console

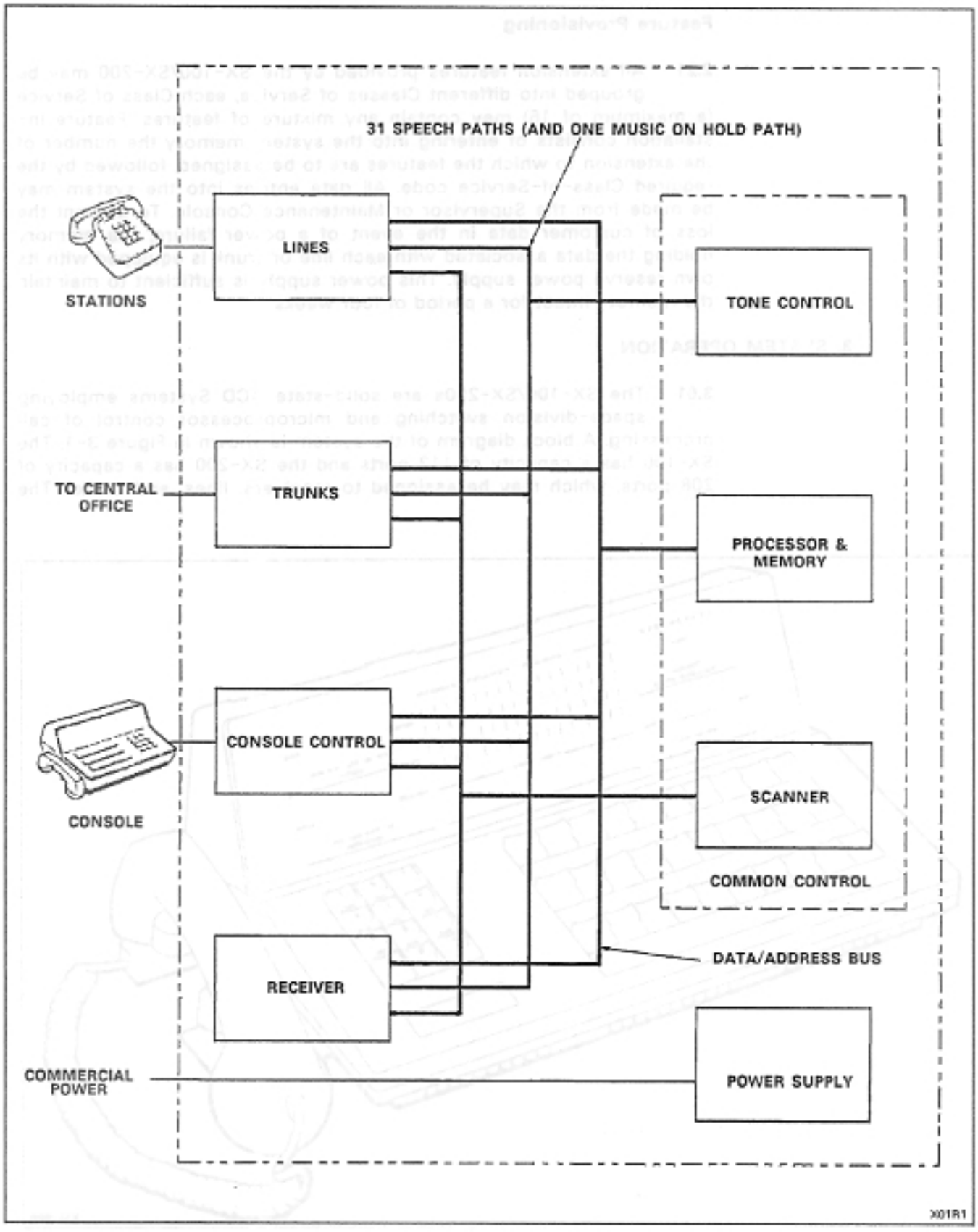


Figure 3-1 Block Diagram

TABLE 2-1
GENERIC ACD SYSTEM FEATURES AND SERVICES

R2

- Attendant-Called Number Display
- Supervisor Calling Number Display
- Supervisor Calls Waiting Indicator
- Supervisor Camp-On with Indication
- Supervisor CCSA Access
- Supervisor Class-of-Service Display
- Supervisor CO Trunk - CO Trunk Connect Enable
- Supervisor Console Emergency Transfer
- Supervisor Console Flash
- Supervisor Console Ringer Codes
- Supervisor-Controlled Conference
- Supervisor Date Display
- Supervisor DISA Code Setup Enable
- Supervisor Function
- Supervisor Hold Circuits
- Supervisor Individual Trunk Access
- Supervisor Jacks
- Supervisor Lamp Test
- Supervisor Lockout
- Supervisor Non-CO Trunk - Non-CO Trunk Connect Enable
- Supervisor Secrecy
- Supervisor Serial Call
- Supervisor Station Busy Out
- Supervisor Time Display
- Supervisor Time Recall
- Supervisor Trunk Busy Out
- Automatic Call Distribution
- Automatic Callback Busy - (Extensions)
- Automatic Callback - Don't Answer
- Automatic Route Selection
- Automatic Station Release
- Automatic Wake-Up (Alarm Call)
- Both Button Enable
- Both Mode Standard
- Broker's Call
- Busy Lamp Field
- Busy Trunk Release
- Busy Verification
- Call Blocking
- Callback Button
- Call Forwarding - Busy (Extensions)
- Call Forwarding - Busy/Don't Answer
- Call Forwarding (System - DID, CCSA, Dial-In Tie Trunks)
- Call Forwarding - Busy/Don't Answer (System - DID, CCSA, Dial-In Tie Trunks)
- Call Forwarding - Don't Answer (Extensions)
- Call Forwarding - Follow Me
- Call Forwarding System Inhibit
- Call Hold
- Call Park
- Call Retrieve (Extensions)
- Call Selection
- Camp-On
- Can Flash if Talking to an Incoming Trunk
- Can Flash if Talking to an Outgoing Trunk
- Can Flash if Talking to an Extension
- Cannot Dial a Trunk After Flashing
- Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk
- CCSA
- Class of Service (COS)
- Common Alerting Devices (Night Bells)
- Console-less Operation
- Contact Monitor
- Control of Trunk Group Access
- Controlled Outgoing Restriction Setup
- Controlled Station Restriction (Do Not Disturb)
- CO Trunk Via Supervisor Inhibit
- Customer-Controlled Programming
- Customer Data Dump/Load
- Customer Data Print
- Data Demultiplexer
- Data Security
- Diagnostics
- Dial Access to the Supervisor
- Dial Call Pickup
- Dial Pulse Signaling
- DID/Dial-In/CCSA Vacant/Illegal Access Intercept to Supervisor
- DID to Non-CO Trunks via Supervisor Inhibit
- Direct-In Lines
- Direct Inward Dial (DID) Trunks
- Direct Inward System Access (DISA)
- Direct Outward Dialing
- Direct Trunk Access
- Directed Call Pickup
- Discriminating Dial Tone
- Discriminating Ringing

TABLE 2-1 (CONT'D)
GENERIC ACD SYSTEM FEATURES AND SERVICES

- Do Not Disturb
- Do Not Disturb Display
- Do Not Overflow (Trunks)
- DTMF to Rotary Dial Conversion (Tone-to-Pulse Conversion)
- Earth Ground Button
- Enable Non-CO Trunk - Trunk Connecting by Extension
- End of Dial Signal or Outgoing Trunks
- Executive Busy Override (Extensions)
- External Call Forwarding
- Feature Access
- First Digit Toll Deny
- Fixed Night Service
- Flash Disable
- Flash for Supervisor
- Flexible Night Service
- Flexible Numbering Plan
- Guest Room Button
- Hands-free Operation
- Hands-free Operation SUPERSET 4 and SUPERSET 3
- Hold Pickup
- Hunting
- Identified Trunk Groups
- Illegal Access Intercept to Supervisor
- Immediate Ring
- Incoming Trunk Call Rotary Only
- Individual Trunk Access
- Inhibit Automatic Supervision
- Limited Wait for Dial Tone
- Line Lockout
- Listed Directory Numbers (LDN)
- Lockout Alarm
- Maid in Room
- Manual Line
- Meet-Me Conference
- Message Registration
- Message Register Audit
- Message Waiting
- Message Waiting Display
- Message Waiting Print
- Minor Alarm Contact - see Contact Monitor
- Mixed Station Dialing
- Multi-Console Operation
- Multi-Digit Toll Control
- Multiple Extensions
- Multiple Trunk Groups with Overflow
- Music on Hold
- Music on Hold Disable
- Never a Consultee
- Never a Forwardee
- New Call Tone
- Night Bells - see Common Alerting Devices
- Night Service Automatic Switching
- No Dial Tone
- Non-CO Trunk Via Supervisor Inhibit
- Originate Only
- Outgoing Trunk Callback
- Outgoing Trunk Camp-On
- Page Button
- Paging Access (Extensions)
- Pickup Groups
- Power Failure Transfer
- Power Supply Requirements
- Printer and Recording Devices
- Printer Transmit Additional Nulls
- Print-outs Extra Line Feeds (Hotel/Motel Only)
- Programming Security
- Range Programming
- Receive Only
- Receiver - Busy Out
- Receiver Direct Selection
- Recorded Announcement Card
- Remote Maintenance Administration and Test System (RMATS)
- Remote System Reset - Protection Override
- Reserve Power Supply
- Reset the System
- Ringing Time-out 1 Minute
- Room Status Audit
- Room Status Update
- Serial Call Override Flash Button Enable
- Single Digit Dialing
- SMDR - see Station Message Detail Recording
- Speech Path - Busy Out
- Speech Path - Direct Selection
- Speed Call
- Station Conference

TABLE 2-1 (CONT'D)
GENERIC ACD SYSTEM FEATURES AND SERVICES

- Station Message Detail Recording
- Station Override Security
- Station Transfer Consultation Hold/Add-On
- Station Transfer Security
- SUPERSET 4
- SUPERSET 3
- SUPERSET Disconnect Alarm
- SUPERSET 4 Immediate Line Selection
- SUPERSET 4 Last Number Redial
- SUPERSET 4 Sub-Supervisor
- Switchhook Flash Timer
- System Identifier
- Tandemning - see Tie Trunks
- Test Line
- Through Dialing
- Tie Trunks
- Timed Automatic Answer Supervision
- Toll Restriction
- Toll Reversal
- Traffic Measurement
- Transfer Dial Tone
- Transfer with Privacy
- Trunk Answer from Any Station (TAFAS) Available During the Day
- Trunk Answer from Any Station (TAFAS)
  (TAFAS) (Night Service)
- Trunk Busy Out Enable
- Trunk Groups
- Trunk Groups Hunting
- Trunk Recall Partial Inhibit
- Trunk-to-Trunk (Supervisor)
- Trunk-to-Trunk (Extensions)
- Vacant Number Intercept to the Supervisor
- Variable Timers
- Verifiable Account Codes

TABLE 2-2
SX-100/SX-200 ELECTRICAL CHARACTERISTICS

R2

SUPERSET Loop Limit	200 ohms
Station Loop Limit	1200 ohms including set
Maximum Number of Ringers per Line	5
Ringing	90 V, 20 Hz – immediate ringing (option of 17 Hz or 25 Hz)
Standard	1 s on, 3 s off
Special	0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
Ring Trip	During silent or ringing period
Dial Tone	350/440 Hz, continuous
Transfer Dial Tone	350/440 Hz, 3 bursts of 100 ms, then continuous
Busy Tone	480/620 Hz, interrupted at 60 ipm
Special Busy Tone	350/440 Hz interrupted at 60 ipm
Standard Ringback Tone	440/480 Hz, 1 s on, 3 s off
Special Ringback Tone	440/480 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
Callback	6 rings of standard ringing
Reorder Tone	480/620 Hz, interrupted at 120 ipm
Conference Tone	440 Hz, 1 burst of 1 s
Camp-On Tone	440 Hz, one burst of 200 ms for station camp-on 440 Hz, two bursts 100 ms on, 50 ms off, 100 ms on for trunk camp-on
Override Tone	440 Hz, one burst of 800 ms followed by a 200 ms burst every 6 s
Crosstalk Attenuation	75 dB minimum
Insertion Loss, Station-to-Station	5 dB ±0.5 dB at 1004 Hz
Station-to-Trunk	0.5 dB ±0.3 dB at 1004 Hz
Trunk-to-Trunk	0.5 dB ±0.3 dB at 1004 Hz
Longitudinal Balance	54 dB minimum, 200-3000 Hz
Return Loss	14 dB minimum
Idle Circuit Noise	16 dBrnC maximum
Impulse Noise	No counts over 46 dBrnC
Envelope Delay Difference	200 μs maximum
System Impedance	600 ohms nominal for lines 600 or 900 ohms nominal for trunks
Traffic Capacity	7.5 ccs/line minimum at 100 lines at P = 0.01
Primary Power	100-125 V, 47-63 Hz, 2 A maximum
Central Office Trunk Loop Limit	1600 ohms
Maximum Distance of Console from Equipment	300 m (1000 ft.) of 26 AWG cable
Operating Environment	0°C to 40°C, (32°F to 104°F) 10% to 90% Relative Humidity
Maximum Number of SUPERSETs	64

ports are scanned sequentially for detection of signals every 3.2 milliseconds.

3.02 Call origination is detected during scanning, an interrupt signal to the microprocessor is generated and a speech path and receiver are assigned to the originating station. After dialing, the receiver is released and the called party is connected to the same speech path as the originator. There are 31 speech paths and one Music on Hold path available in the SX-100/SX-200, and all of the ports have access to all speech paths. For further information see Section MITL9105/9110-090-180-NA.

4. SYSTEM CONFIGURATION

General

4.01 Figure 2-2 illustrates the SX-100 cabinet layout. Figure 2-3 illustrates the SX-200 cabinet layout.

Equipment Shelf

4.02 The equipment shelf contains the three common control cards plus the required number of line, trunk, console control and receiver cards. The common control cards are color-coded and held in card positions 18 through 20. The console control cards occupy positions 16 and 17, and the first receiver card position 15. These card positions are fixed for all systems. Card positions 1 through 14 may be equipped with line, trunk or receiver cards as shown in Figure 4-1.

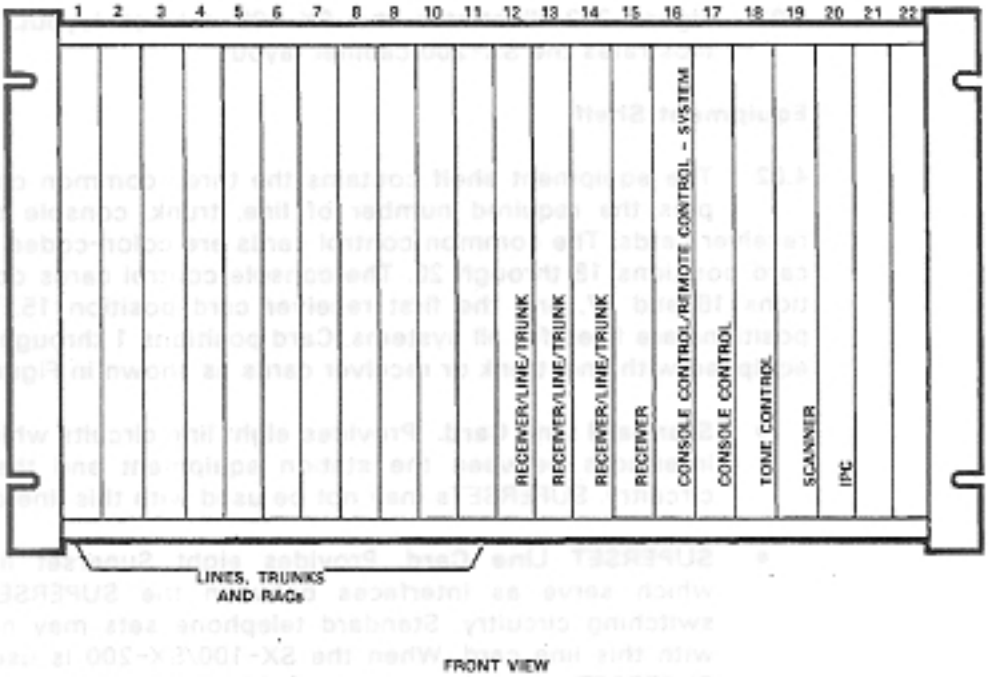
- **Standard Line Card.** Provides eight line circuits which serve as interfaces between the station equipment and the switching circuitry. SUPERSETs may not be used with this line card.

- **SUPERSET Line Card.** Provides eight Superset line circuits which serve as interfaces between the SUPERSET and the switching circuitry. Standard telephone sets may not be used with this line card. When the SX-100/SX-200 is used with the SUPERSETs a maximum of 64 SUPERSETs may be used.

- **Trunk Card.** Provides either interfacing between the Central Office and the switching circuitry for four trunks, or other Systems for two tie trunks.

- **Receiver Card.** The Dual Receiver or Quad Receiver cards, respectively, contain two or four sets of rotary dial and DTMF receivers, which are used to detect dialed digits and transfer them to a temporary store for call processing.

- **Console Control Card.** This card provides the interface between the common control and two consoles. The first console control card (in position 17) is assigned to Supervisor Console 1 and the Maintenance Console. The second console control card (in position 16) is assigned to Supervisor Console 2.



SHELF 1

X5619

Figure 4-1 Equipment Shelf

- **Remote Control - System Card.** This card allows the System to be accessed from a remote maintenance center. The card is not normally supplied with the system and forms part of the RMAT System (consult Section MITL9105/9110-098-101-NA, Remote Maintenance, Administration and Test System).

- **Tone Control Card.** All call progress tones are supplied by this card. In addition, this card contains the DTMF and DP pulse generators, voice paging circuitry and diagnostic testing functions.

- **Scanner Card.** This card sequentially scans all ports to detect signals that require processor action. It also contains the night bell, paging control relays, 2-digit display and the master reset button. This card also sets: the baud rate for the RS232 printer port as 300 or 1200 baud, the parity, stop bits and word length.

- **IPC.** The IPC (Integrated Processor Control) contains all operating software in the form of PROM and RAM and the microprocessor (68b09). There are 160 k/bytes of PROM and 48 k/bytes of RAM. Of the 48 k/bytes of RAM 34 k/bytes are write protected and the remaining 14 k/bytes are not write protected. All customer memory is protected from power failure by a card mounted battery pack. The actual Generic information is contained in the PROM and is non-volatile.

- **RAC.** The RAC (Recorded Announcement Card) occupies one peripheral slot in the system and provides two different 8 second recordings using digital solid-state storage. Messages are recorded from the Supervisor's position and two messages may be added for a total of 16 seconds.

Supervisor Console

4.03 The layout of the SX-100/SX-200 Supervisor Console is shown in Figure 2-7. Three rows of buttons on the console faceplate are used to select and handle calls. Each button has a light-emitting diode (LED) associated with it to indicate the operational status of the button.

4.04 The console display area provides the supervisor with specific information concerning the call which is being handled, as well as general information such as the time of day, and the busy/idle status of system stations and Trunk Groups.

4.05 A brief description of the display, and the functions of each pushbutton is in the following paragraphs.

Console Display

4.06 Housed on the upper face of the console are the following displays:

- **TRUNK GROUP STATUS.** One LED per Trunk Group is used to signal the busy status of the group (BUSY). Another LED per Trunk Group is used to indicate that the supervisor has changed the Trunk Group from dial access to supervisor access (ATT). These indications are provided for up to 10 Trunk Groups.

- **CALL WAITING (CW).** Indicates how many calls to the console are waiting to be answered.

- **TIME.** A 12-hour or 24-hour digital clock is provided as a standard item. This display may optionally show the date when the IDENT button is pressed.

- **ALARM.** This area contains three LEDs labelled: MAJ (major), CON (console), and MIN (minor). A MAJOR alarm indicates a serious system malfunction and that failure transfer circuits have operated. A CONSOLE alarm indicates a console malfunction, and a MINOR alarm indicates that a nonessential circuit malfunction has been detected by the system.

- **BUSY LAMP FIELD.** The center of the display area contains the Busy Lamp Field, which provides a LED for each of 200 stations or trunks. When a station or trunk is busy, the associated LED is illuminated.

- **SOURCE.** This area provides specific information on any party who calls the supervisor.

(1) **NUMBER.** Displays the calling number.

(2) **CLASS.** Displays the calling party's Class of Service.

(3) **ATT.** Indicates that the supervisor is talking to the calling party.

(4) **INT.** Identifies the call as an intercept call.

(5) **RCL.** Identifies the call as a recall.

(6) **DID.** Identifies the call as a Direct Inward Dial call to the supervisor.

(7) **MAN.** Identifies the call as a Manual Line Service call.

- **DESTINATION.** The destination area supplies specific information about the party called by the supervisor.

(1) **NUMBER.** Displays the number of the called party.

(2) **CLASS.** Displays the Class of Service of the called party.

(3) **ATT.** Indicates that the supervisor is talking to the called party.

(4) **RING.** Indicates that the called party is ringing.

(5) **BUSY.** Indicates that the called party is busy.

(6) **ERR.** Indicates to the supervisor that an invalid number has been dialed.

Console Faceplate

4.07 The console faceplate holds the following buttons:

- **LAMP TEST.** This button, when pressed, causes all the console LEDs and 7-segment displays to turn on. In this way faulty LEDs or displays can be readily detected. In addition the display will lock if the LAMP TEST button is depressed longer than 5 s, and release when any button is pressed or any action requiring the supervisor occurs.

- **ALARM RESET.** This button is pressed to reset the audible alarm signal in the event of an alarm, and also displays an alarm identification code in the Source and Destination display areas.

- **BELL OFF.** The console bell is disabled when this button is pressed. The LED associated with the button indicates the bell off condition. The bell can be reactivated by pressing the button again.

- **IDENT.** In the event of a faulty connection through the console, operation of this button will display the circuits used in the connection. The circuits used are displayed for as long as the button is held down. When the console is idle pressing the IDENT key identifies the software installed in the system and the console identification. In either situation the date will appear in the TIME display.

- **NIGHT 1.** This button is used to switch the system into and out of Night Service 1. The associated LED, when lit, indicates that the system is in Night Service 1.

- **NIGHT 2.** This button is used to switch the system into and out of Night Service 2. The associated LED, when lit, indicates that Night Service 2 has been selected. Night Service 1 and Night Service 2 are mutually independent of each other.

- **ROOM RESTR.** The ROOM RESTR button is used to prevent unauthorized outgoing calls from guest rooms when they are vacant.

- **ROOM STATUS.** The function of this button is to monitor the status of each room. Pressing this button and dialing one of five possible single digit codes indicates, on the BUSY LAMP

FIELD display, which rooms correspond to a particular status condition.

- **MSGE WAIT.** This feature is enabled by the supervisor calling a room and pressing the MSGE WAIT button. This causes the room telephone to receive a burst of three rings every 20 minutes.

- **DO NOT DISTB.** This feature enables a guest at his request not to receive incoming calls.

- **CALLBACK.** This button allows the supervisor to access the automatic callback feature.

- **CANCEL.** The CANCEL button is used to cancel a misdialed or busy call.

- **HOLD 1-4.** The supervisor can place a current call on hold by pressing one of the HOLD buttons. The associated LED will light to indicate that the hold circuit is busy.

- **CALL BLOCK.** Rooms and all vacant rooms may be restricted from calling other rooms for specific time periods.

- **FLASH.** This button is pressed to flash the telephone company operator on long-distance calls. The FLASH button may be programmed as the SERIAL CALL button or a silent MONITOR button.

- **SERIAL CALL.** This button is pressed to enable incoming Central Office calls to recall to the console when the called station hangs up.

- **GUEST ROOM.** When this button is pressed and the room number dialed, Guest Room information will be displayed.

(1) The room number and the "Message Register" status in the SOURCE display.

(2) The "Room Status" indicated by a digit (followed by "." if the maid is in the room) and a set Wake-Up in the Destination display.

(3) The "Do Not Disturb" status (indicated by DO NOT DISTB lamp).

(4) The "Message Waiting" status (indicated by MSGE WAIT lamp).

(5) The "Controlled Outgoing Restriction" status (indicated by ROOM RESTR lamp).

(6) Automatic Wake-Up

- **CONF.** The conference button is used to set up a supervisor conference. The associated LED flashes to indicate a recall from

the conference, and remains in a steady on condition to indicate that the conference circuit is in use.

- **PAGE.** Pressing the PAGE button gives the supervisor access to the paging equipment for as long as the button is held down. The associated LED indicates that the paging equipment is busy.

- **OVERRIDE.** This button allows the supervisor to override an existing conversation. The FLASH button may also be programmed as a MONITOR button. Overrides performed using the OVERRIDE button give parties being overridden an intrusion tone. Overrides performed using the FLASH button programmed as a MONITOR button do not give parties being overridden an intrusion tone.

- **RELEASE.** This button is used to release the supervisor from connections made through the console.

- **RECALL.** The LED associated with the RECALL button flashes to indicate a recall to the supervisor. The recall may be answered by pressing the RECALL or ANSWER button. After answering, both the RECALL and ANSWER LEDs remain in a steady on condition.

- **DIAL 0.** This button flashes to indicate a dial "0" call, which may be answered by pressing the DIAL 0 or ANSWER buttons. After answering both ANSWER and DIAL 0 LEDs remain in a steady on condition.

- **LDN 1-4.** The LEDs associated with these four buttons flash to indicate up to four different types of incoming trunk calls (e.g. FX, CO, WATS, TIE). These may be answered by pressing the appropriate LDN button or the ANSWER button. After answering, both the LDN and ANSWER LEDs remain in a steady condition.

- **SOURCE.** This button is pressed to split the supervisor to the source side of a call. The LED indicates the split condition to the source.

- **BOTH.** This button is pressed to connect the supervisor to both the source and destination parties. The associated LED lights to indicate the 3-way connection.

- **DEST.** The destination button is pressed to connect the supervisor to the destination side of a call. The associated LED is activated whenever the supervisor is split to the destination.

- **ANSWER.** This is a common answer button for calls appearing on the RECALL, DIAL 0 and LDN 1-4 buttons. The ANSWER LED flashes when any incoming call appears on the console, and remains in a steady on condition when the call is answered.

4.08 In addition to the buttons and LEDs described above, the console has a 12-digit key pad which is used for dialing all calls, an emergency transfer switch (mounted on the back of the console) which switches the system into failure transfer mode, and a volume control (mounted on the back of the console) to vary the bell volume.

4.09 All console buttons are non-locking.

Audible Incoming Discrimination

4.10 The console incorporates audible signal discrimination. Under some conditions requiring supervisor service, distinctive audio codes are issued by the tone ringer. With this facility, visually impaired supervisors can operate the console and be aware of the various calling-in situations that can arise. These situations are as follows:

- Incoming calls, i.e., LDN calls, Dial 0 calls or Recalls.
- HOLD connection time-outs.
- A "flash-for-supervisor" occurring during a Supervisor-Controlled Conference.
- A MINOR alarm flashing.

4.11 For use by a visually impaired supervisor, all events requiring supervisor recognition are placed in a queue and give an audible signal on a first-in, first-out basis. In the case of the first situation (LDNs, DIAL 0 or RECALL), the same audible signal is given indicating that the call can be answered with the ANSWER button. To find the actual button the visually impaired operator can poll the keyboard. The remaining events have distinctive audible signals and may be readily associated with the relevant button. For further information, see Section MITL9105/9110-090-315-NA.

Keyboard Polling

4.12 For proper operation of the console, a visually impaired supervisor must be aware of the status of the keyboard. For example, he/she must know whether the BELL OFF or NIGHT 1 button has been enabled. To do this the supervisor presses the LAMP TEST button in the silent mode (the ringer is off, the 7-segment indicators are on and the LEDs are off). While this button is held depressed, the remaining relevant buttons are pressed in turn. If the LED associated with a button is lit, the ringer will sound as long as the button is pressed down. If the LED is flashing, the ringer will give a 0.5 second on, 0.5 second off audible signal. In this manner the status of the BELL OFF, NIGHT 1 or any button (including an incoming call) can be determined and appropriate action taken. When this operation takes place, the LAMP TEST button is the last to be released, otherwise the current button being polled will become active when the LAMP TEST is released first.

5. AUTOMATIC CALL DISTRIBUTION

ACD General

5.01 The SX-100/SX-200 ACD provides a method of operation whereby a large volume of incoming trunk traffic is focused on one or more groups. These groups or agents are customer trained/equipped to provide the particular information or service the caller is requesting. The incoming trunk listed directory numbers (LDN) are published as a specific service. These services may be 800 numbers, any reservation line number, general inquiries number, etc.

5.02 The system manages various recordings, which can be connected to an incoming trunk (at predetermined intervals) if no agents are free to handle the call. The system will also choose the agent to be given the call (if the system is programmed to do so) such that all Agents are given an equal workload.

5.03 A Supervisor normally oversees the operation, while monitoring the activity of the Agents, and coping with unusual situations which may arise.

ACD Feature Summary

5.04 The ACD System allows various agent positions to handle large volumes of short term trunk traffic. The following features may be programmed to enhance the agent traffic handling ability and administration:

- Agent positions can use SUPERSET 4 for Account Code entry while handling a trunk call.
- Agents have an identity (ID) code and can move between agent positions by logging in and out.
- Up to 63 agent ID codes available.
- Up to 30 active logged-in Agents using the system simultaneously.
- Calls are allocated to Agents based upon previous workload to ensure an equal distribution.
- A predetermined work time 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 that help is required.
- Up to 12 Agent Groups available. The total number of Agent Groups is dependent upon the number of Recording Groups

programmed. That is the sum total of Recording Groups and Agent Groups cannot exceed 12.

- For further information see Section MITL 9105/9110-090-222-NA.

Supervisor Functions

5.05 The Supervisor position may be either Attendant or Supervisor Console and provides the following features:

- Supervisor functions are performed with standard Supervisor Console
- Supervisor can request management information to output to a recording device.
- Supervisor can monitor the Mean Time to Answer (MTTA), the Mean Abort Time (MAT), the number of active Agents and the number of calls waiting for all Agent Groups.
- Control of ACD features.
- The Supervisor is notified instantly when the MTTA exceeds a preset maximum for an Agent Group.
- The Supervisor may assist Agents (with SUPERSET 4s) when help is required.
- The Supervisor can monitor an Agent's conversation without any audio intrusion by using the MONITOR.

Performance Data

5.06 The ACD System provides the following print-outs:

- Automatic print of shift summary when an Agent logs off. The summary gives shift start time, shift duration, number of calls answered, and total duration of all calls handled.
- Supervisor can request a print giving the number of calls answered, the number of calls routed away from the Agent Group (to another group, extension etc.) and the number of calls aborted (given up by caller before serviced by an Agent) for every Agent Group.
- Account code usage by the Agents can easily record valuable data (in the standard SMDR record) retrieved from the calls handled.
- Standard Traffic Measurement Reports.

Recorded Announcements

5.07 The ACD System provides for various recorded announcements for incoming trunks that are not answered in specified times. This feature includes:

- MITEL Recorded Announcement Card (RAC). This card occupies one slot in the system and provides two different 8 second recordings using digital solid-state storage. Messages are recorded from the Supervisor's position and are stored in non-volatile RAM.

- Customer provided recorded announcement devices (RADs) are also supported. The device connects to the System using a standard tip-ring pair of a regular Line Card.

- Intervals between recording playbacks for each Agent Group's trunks can be specified, or can be selected to be automatically determined according to the current Mean Time To Answer (MTTA).

- Number of RACs and RADs used are limited only by the peripheral slots available.

- Up to 12 Recording Groups available (number of different messages provided) for each Recording Group programmed subtract one Agent Group.

Incoming Trunks

5.08 The ACD System provides the following features for handling incoming trunks:

- Automatic two-level priority selection - while waiting for service from an Agent Group, a trunk programmed as in Trunk Group 12 will have priority over all others. This allows the System to specify that certain trunks are answered before others.

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

- DID Trunk calls to vacant or illegal numbers may be diverted to a Recording Group.

6. SUPERSETs

Introduction

6.01 The SUPERSET 4 is a microprocessor-controlled electronic telephone set (Figure 6-1). The set uses a liquid crystal display (LCD) for line status indication and user prompting. In addition the SUPERSET 4 utilizes push buttons for single keystroke feature selec-

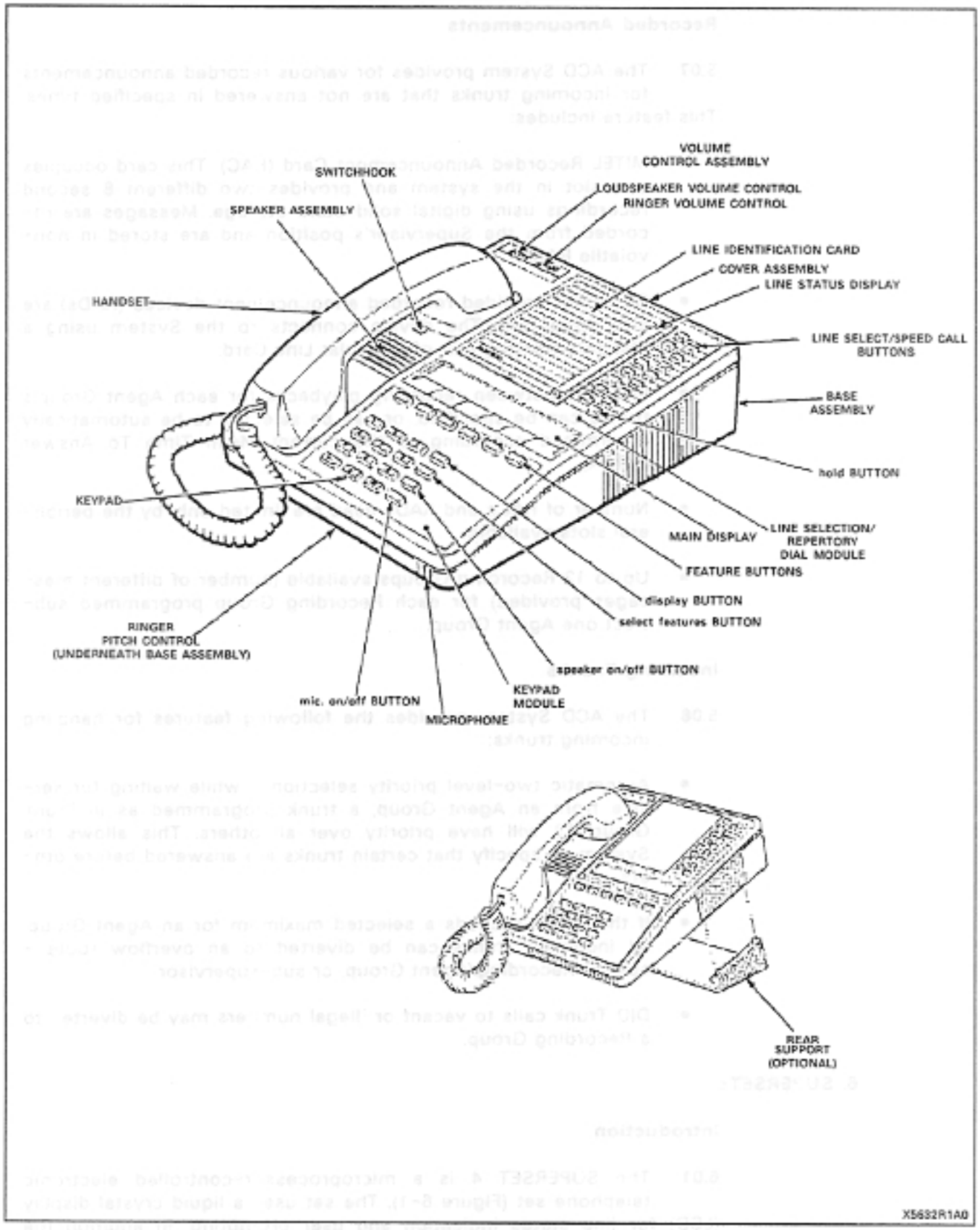


Figure 6-1 SUPERSET 4

tion. For specific information on the SUPERSET 4 features, see Section MITL9105/9110-090-107-NA. The SUPERSET 3 is also a microprocessor-controlled electronic telephone set (Figure 6-2) and provides a subset of the SUPERSET 4 features without the LCD display. Either SUPERSET can be used only with a SUPERSET Line Card. Standard telephones are not compatible with this Line Card.

7. SUPERSET 3

General

7.01 The SUPERSET 3 provides the following operational features:

- Single button feature activation.
- Multiline appearances (installer programmed) of up to 3 lines including primary line (set directory number). Multiline appearances may be a mixture of lines and trunks, and may also be multiappearances of same line.
- Speed Call.
- Automatic selection of primary line.
- Pushbutton selection of non-primary line.
- Automatic ringing line selection (programmed option).
- Hold function for any call at the SUPERSET.
- User programming of call forward destination number, Speed Call entry.
- Hands-free operation, with switchable microphone.
- Volume controls for ringer and loudspeaker.
- Ringer pitch control.

7.02 The SUPERSET 3 provides the following installation features:

- Turn-key installation. Connection to local area wiring by means of a modular jack.
- No additional wiring; power, signaling, and voice carried over a single pair. Additional pair required only if Call Announce service is set up.

7.03 In addition the SUPERSET 3 provides user confidence in handling incoming or outgoing calls. The user makes the fullest use of all features in the user's assigned Class of Service by various key assignments.

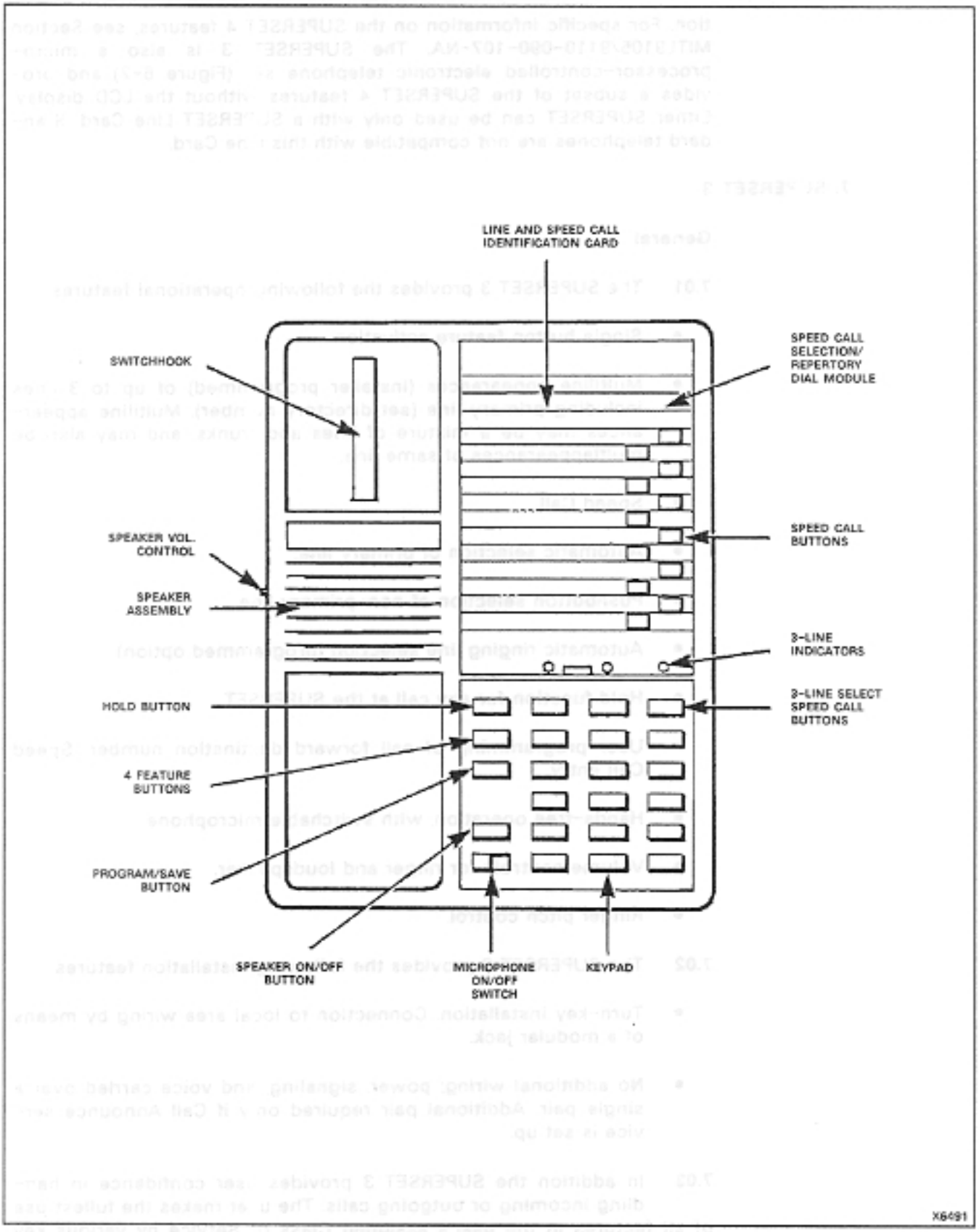


Figure 6-2 SUPERSET 3

7.04 The SUPERSET 3 body and handset are of plastic construction. The dimensions of the SUPERSET 3, with handset on-hook, are given in Figure 7-1. The body and handset are interconnected via a modular detachable handset cord, plugged into the side of the body. Line connection to the set is by means of a modular detachable line cord, plugged into the rear of the set. An optional rear support can be clipped in position beneath the set. This would be used when the set is likely to be placed some distance from the user.

Body

7.05 The body of the SUPERSET 3 comprises two parts - a base assembly and a cover assembly.

Base Assembly

7.06 The base assembly contains a microphone (for hands-free operation), the switchhook, modular jacks for the handset and line cords, and a speaker assembly (for hands-free operation and tone ringer output). The microphone is mounted in a position permitting it to receive sound passing through an aperture in the front of the base assembly. The speaker is mounted between the handset recesses, and projects sound upwards through a grill beneath the handset. A screwdriver slotted control for adjusting ringer pitch is user-accessible underneath the base assembly.

Cover Assembly

7.07 The cover assembly houses a volume control assembly, a keypad module, and a line selection/repertory dial module.

Volume Control Assembly

7.08 The volume control for the speaker and ringer, is mounted on the left-hand side of the cover assembly. There is also a paper for the installation telephone number, and the paper is held in place by a transparent plastic lens that is clipped in position.

Keypad Module

7.09 The keypad module contains a standard 12-button keypad, seven feature buttons, and three supplementary line select buttons.

Line Selection/Repertory Dial Module

7.10 The line selection repertory dial module contains three line select buttons, LED line status display. In addition there are 12 Speed Call keys.

7.11 Associated with the keys and the line status display is a line identification card. This card identifies the primary line (extension) and hold buttons, and provides space for function identification (i.e. line and speed call identities) of the remaining buttons.

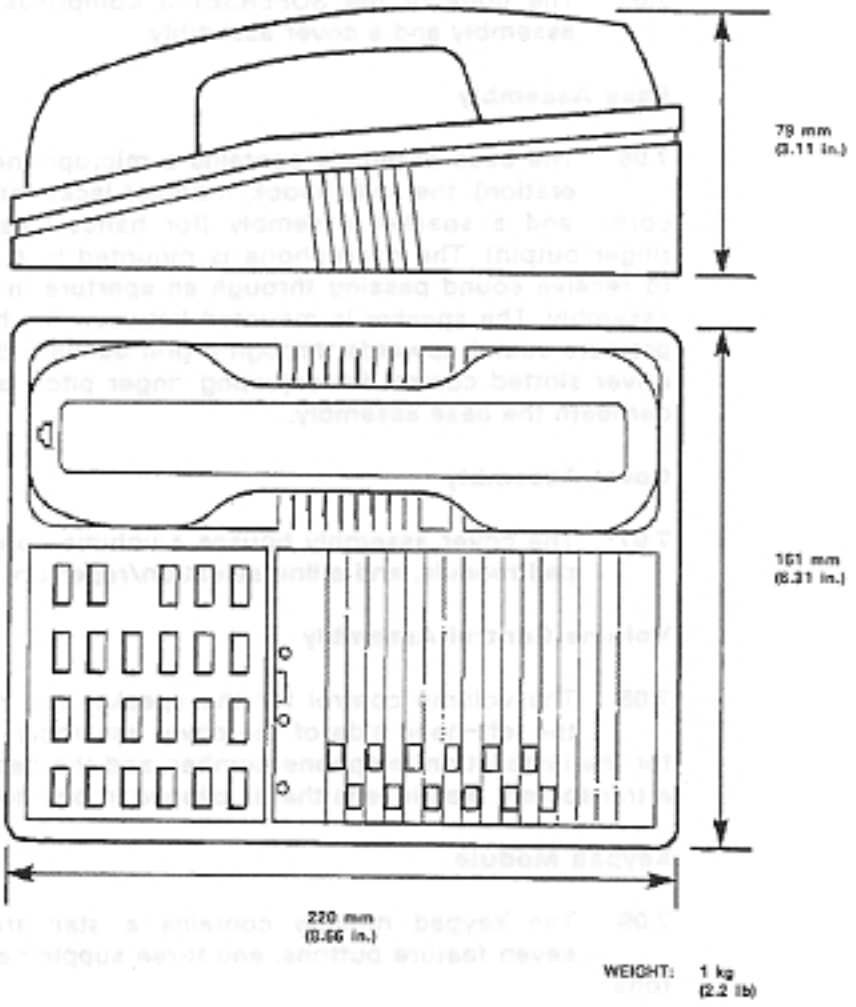


Figure 7-1 SUPERSET 3 Dimensions

The card is held in place with a transparent plastic lens that is clipped in position.

8. SUPERSET 3 FUNCTIONAL DESCRIPTION

General

8.01 The SUPERSET 3 face layout is shown in Figure 6-2. The following text describes the function of each button and display. All buttons are non-interlocking.

Line Select/Speed Call Buttons

8.02 There are three line select keys which can be configured (at the time of programming) to select preassigned lines, in order to receive or originate calls. In addition there are 12 Speed Call keys.

Hold Button

8.03 This button allows the set user to hold any call at the set. The line on which the call is held is indicated by the adjacent line status display flashing on and off. The call may be retrieved by pressing the HOLD Key.

Feature Buttons

8.04 There are six feature buttons. Each button is associated with a specific feature. The user selects the feature, or action, by pressing the appropriate feature button.

Supplementary Feature Buttons

8.05 **Speaker on/off.** This button allows the set user to receive or originate calls without use of the handset. Pressing the button once switches the speaker and microphone on and selects the prime line. Each time this button is pressed, the speaker and microphone are switched alternately on and off, and the set is switched between on- and off-hook conditions.

8.06 **Mic on/off.** This switch is used to switch the microphone off during hands-free operation, in order to either prevent transmission of local sound, or improve reception when the set is installed in a noisy environment.

8.07 **SWAP.** The SWAP key allows the user to effect a broker's call between two calls.

8.08 **TRANS/CONF.** This key allows the user to put a call on hold, dial a new number and conference the call or transfer the call on hold to the new number.

8.09 **REDIAL.** This key when pressed automatically redials the last manually dialed trunk call.

8.10 **CANCEL.** This key cancels any dial action performed at the SUPERSET 3.

8.11 **PROGRAM/SAVE.** This key allows the user to program and save Speed Dial numbers at specified Speed Dial key locations.

9. SUPERSET 4

General

9.01 The SUPERSET 4 provides:

(a) Visual features, visual line or trunk status indication by means of LCD symbols adjacent to each line select button.
- 16-character alphanumeric display for time-of-day and date (provided by system), digit echoing, Speed Call number, call forward destination number, timed-reminder setting, caller identification, and messages from the system.
- Displayed word prompts signifying all valid call-handling options at any given time.

(b) Operational features
- Single button feature activation.
- Agent help feature.
- Account Code Entry.
- Multiline appearances (installer programmed) of up to 15 lines including primary line (set directory number). Multiline appearances may be a mixture of system lines and trunks, and may also be multiappearances of same line.
- Speed call entry at each unassigned line.
- Automatic selection of primary line.
- Pushbutton selection of non-primary line.
- Automatic ringing line selection (system programmed option).
- Hold function for any call at the set.
- User programming of timed reminder, call forward destination number, speed call entry and messages.
- Hands-free operation, with switchable microphone.
- Volume controls for ringer and loudspeaker.
- Ringer pitch control.

(c) Installation features
- Turn-key installation. Connection to local area wiring by means of a modular jack.
- Ease of installation. Power, signaling, and voice carried over a single pair. Additional pair required only if Call Announce service is set up.

(d) User impact
- User confidence in handling incoming or outgoing calls, through application of visual word prompts automati-

cally displayed on an LCD. These prompts signify all valid call-handling options at any given time.

- User capability to make the fullest use of all system features in his Class of Service, by means of the visual word prompts mentioned above.

Physical Description

9.02 The SUPERSET 4 body and handset are of plastic construction. The dimensions of the SUPERSET 4, with handset on-hook, are given in Figure 9-1. The body and handset are interconnected via a modular detachable handset cord, plugged into the side of the body. Line connection to the set is by means of a modular detachable line cord, plugged into the rear of the set. An optional rear support can be clipped in position beneath the set. This would be used when the set is likely to be placed some distance from the user.

Body

9.03 The body of the SUPERSET 4 comprises two parts - a base assembly and a cover assembly.

Base Assembly

9.04 The base assembly contains a microphone (for hands-free operation), the switchhook, modular jacks for the handset and line cords, and a speaker assembly (for hands-free operation and tone ringer output). The microphone is mounted in a position permitting it to receive sound passing through an aperture in the front of the base assembly. The speaker is mounted between the handset recesses, and projects sound upwards through a grill beneath the handset. A screwdriver slotted control for adjusting ringer pitch is user-accessible underneath the base assembly.

Cover Assembly

9.05 The cover assembly houses a volume control assembly, a keypad module, and a line selection/repertory dial module.

Volume Control Assembly

9.06 Two volume controls, one each for speaker and ringer, are mounted in the upper left-hand corner of the cover assembly. The controls are edge-mounted and are identified with a printed card insert. This card also has space for the installation telephone number, and is held in place by a transparent plastic lens that is clipped in position.

Keypad Module

9.07 The keypad module contains a standard 12-button keypad, six feature buttons, and four supplementary feature buttons.

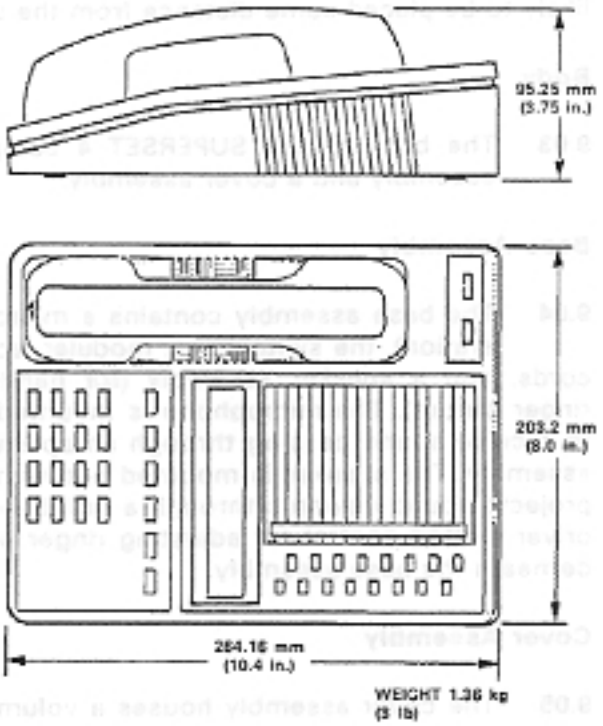


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Figure 9-1 SUPERSET 4 Dimensions

Line Selection/Repertory Dial Module

9.08 The line selection/repertory dial module contains 15 line select/speed call buttons, a hold button, an LCD line status display, and an LCD feature display.

9.09 Associated with the buttons and the line status display is a line identification card. This card identifies the primary line (extension) and hold buttons, and provides space for function identification (i.e., line and speed call identities) of the remaining buttons. The card is held in place with a transparent plastic lens that is clipped in position.

10. SUPERSET 4 FUNCTIONAL DESCRIPTION

General

10.01 The SUPERSET 4 face layout is shown in Figure 10-1. The following parts describe the function of each button and display. All buttons are non-interlocking.

Line Select/Speed Call Buttons

10.02 There are 15 line select/speed call buttons which can be configured (at the time of system programming) to select preassigned lines, in order to receive or originate calls. These lines can be a mix of a variety of line types (e.g., key, multiple call, direct trunk select, personal outgoing, and private). Those buttons not assigned a line are available to the user for storage and later use of speed call numbers.

Hold Button

10.03 This button allows the set user to hold any call at the set. The line on which the call is held is indicated by the adjacent line status display flashing on and off. When a call is held, the alphanumeric display prompts the user to select another line; only after another line is selected will dial tone be returned. Otherwise, the call is held and can be retrieved by pressing the associated line select button.

Feature Buttons

10.04 There are six feature buttons. Each button is associated with a specific group of word prompts on the features display.

10.05 In operation, the set displays only the word prompts that are valid at that time. In any specific group of prompts, only one prompt can be displayed. The user selects the feature, or system action, by pressing the button immediately below the prompt that describes that action.

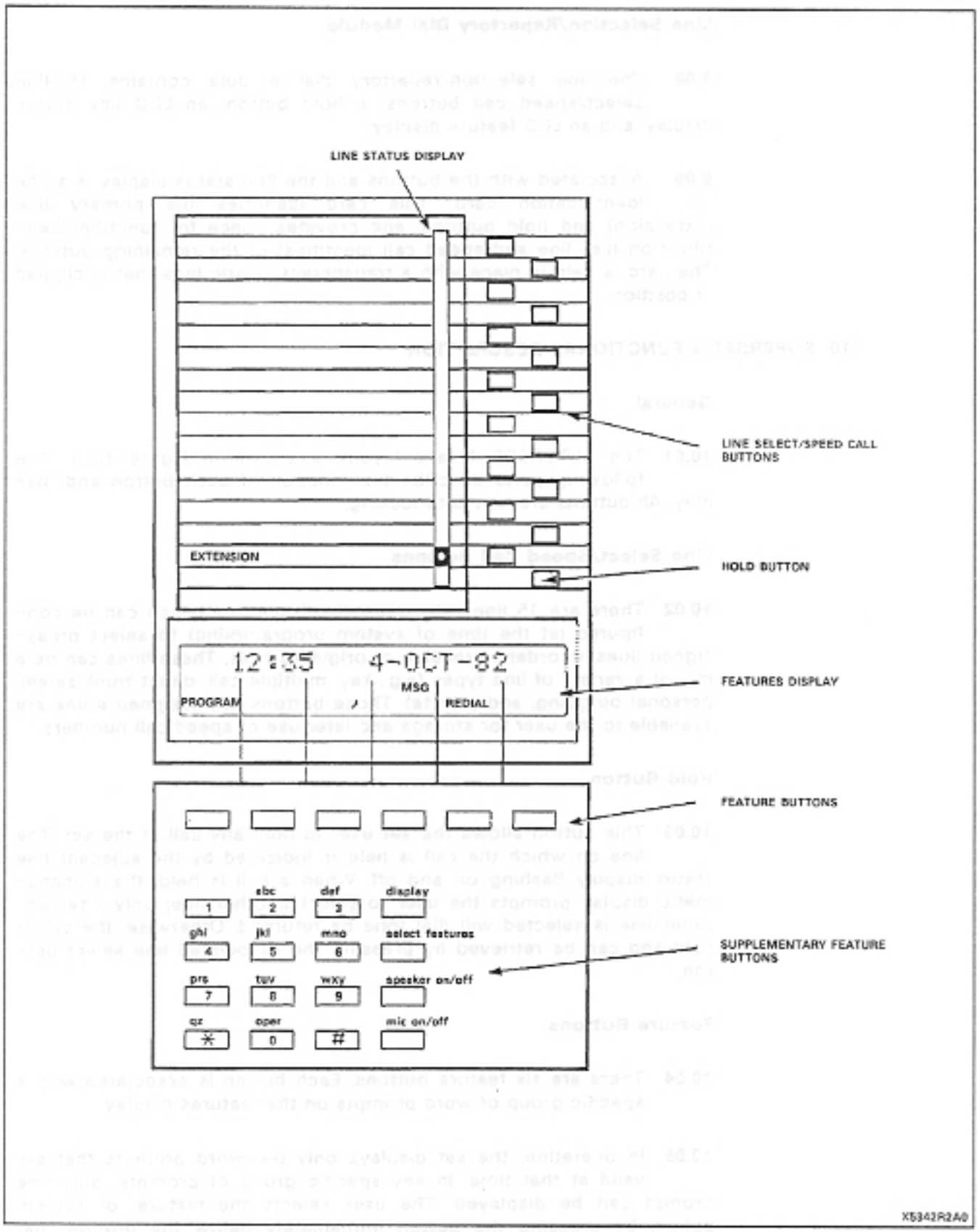

Figure 10-1 SUPERSET 4 Buttons and Displays

Supplementary Feature Buttons

10.06 **Display:** Allows the user to have displayed on the alphanumeric display:

- Identification of lines at the set
- Saved numbers for speed call
- Number saved for redial
- Identification of source of incoming calls
- Identification of caller camping on timed-reminder setting
- Call forward destination.

10.07 The actual item to be displayed is selected after the display button is pressed, by either pressing a line select/speed call button (for line identification, caller identification, or speed call number) or pressing a feature button under the prompt associated with the item. To clear the display, the EXIT feature button is pressed.

10.08 **Select Features.** Features which may be activated at any time, as opposed to those which may be selected only at fixed times, are displayed on the features display when the select features button is pressed.

10.09 The features which can be selected (e.g., Do Not Disturb) are displayed adjacent to the alphanumeric display. The alphanumeric display instructs the user to "DIAL FEATURE NO.", which is a reference to the number adjacent to the name of the feature in the features display. To select the feature, the user dials this number from the keypad.

10.10 **Speaker on/off.** This button allows the set user to receive or originate calls without use of the handset. Pressing the button once, switches the speaker and microphone on and selects the prime line. Each time this button is pressed, the speaker and microphone are switched alternately on and off, and the set is switched between on- and off-hook conditions. While the microphone is on, a visual reminder (MIC ON) is displayed on the features display.

10.11 **Mic on/off.** This button is used to switch the microphone off during hands-free operation, in order to either prevent transmission of local sound, or improve reception when the set is installed in a noisy environment. While the microphone is on, a visual reminder (MIC ON) is displayed on the features display.

Line Status Display

10.12 This is a liquid crystal display mounted adjacent to the line select buttons. The display contains 15 identical symbol groups: the symbols are aligned with the line select/speed call buttons.

10.13 The different states of a symbol group, and the meaning of each state, are shown in Figure 10-2.

SYMBOL	DESCRIPTION	MEANING
	NO SYMBOL IN DISPLAY	LINE IDLE
	DISPLAY ALTERNATES BETWEEN THESE TWO SYMBOLS	INCOMING CALL
	DISPLAY SOLID SQUARE	LINE BUSY AT THIS SET
	DISPLAY SOLID CIRCLE	LINE BUSY AT ANOTHER SET
	DISPLAY ALTERNATES BETWEEN SOLID AND CLEAR	CALL ON HOLD AT THIS SET
	DISPLAY CIRCLE FLASHES ON AND OFF	CALL ON HOLD AT ANOTHER SET

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Figure 10-2 Line Status Display Symbols

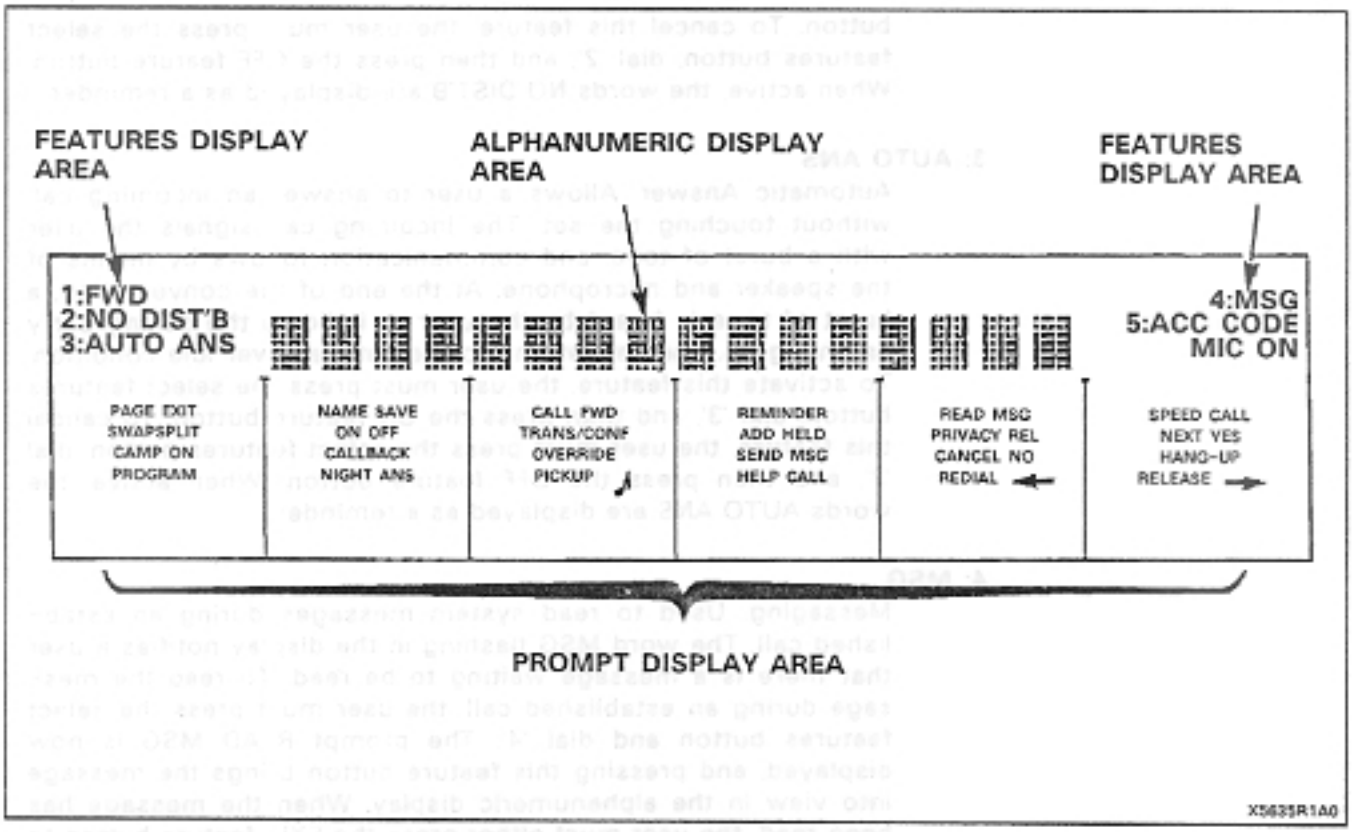

Figure 10-3 Features Display Layout

Features Display

10.14 This is a liquid crystal display mounted adjacent to the feature buttons. The features display is divided into three functional areas, as shown in Figure 10-3.

10.15 **Features Display Area.** The words displayed in this area indicate the features that may be selected at any time. Those features which are not in the Class of Service are not displayed. Display of the words is initiated by pressing the display features key.

10.16 The meaning of each feature name is as follows:

1: FWD

Call Forward. This feature is automatically invoked after setting up call forwarding type and destination. To cancel the feature, the user must press the select features button, dial '1', and then press the OFF feature button. To reactivate the feature, the user must press the select features button, dial '1', and then press the ON feature button. When active, the word FWD is displayed as a reminder.

2: NO DIST'B

Do Not Disturb. Prevents an incoming call from ringing the user's set. To activate this feature, the user must press the select features button, dial '2', and then press the ON feature

button. To cancel this feature, the user must press the select features button, dial '2', and then press the OFF feature button. When active, the words NO DIST'B are displayed as a reminder.

3: AUTO ANS

Automatic Answer. Allows a user to answer an incoming call without touching the set. The incoming call signals the user with a burst of tone, and communication follows by means of the speaker and microphone. At the end of the conversation, a burst of tone is heard by the user to indicate the calling party has hung up. The set returns to the auto-answer idle condition. To activate this feature, the user must press the select features button, dial '3', and then press the ON feature button. To cancel this feature, the user must press the select features button, dial '3', and then press the OFF feature button. When active, the words AUTO ANS are displayed as a reminder.

4: MSG

Messaging. Used to read system messages during an established call. The word MSG flashing in the display notifies a user that there is a message waiting to be read. To read the message during an established call, the user must press the select features button and dial '4'. The prompt READ MSG is now displayed, and pressing this feature button brings the message into view in the alphanumeric display. When the message has been read, the user must either press the EXIT feature button to clear the display and leave the message active, or press the CANCEL feature button to clear the display and cancel the message. If there are other messages to be read, the user must press the NEXT feature button to bring the next message into view.

5: ACC CODE

Account Code. It may be necessary for a user to enter an account code before being allowed access to a trunk; or a user may require an SMDR record of an account number against a call. In either case, the user must press the select features button and dial '5'. The account number can now be dialed from the keypad, and the digits are displayed; no DTMF tones are heard as signaling of the code is a data transfer function. A correct account code is entered when the user presses the SAVE feature button. The system responds with the display 'ACKNOWLEDGED' when the code is recorded on the SMDR, or 'PLEASE TRY LATER' when the SMDR recording device is busy. More than one code can be associated with a single call.

10.17 The word MIC ON has an advisory function and, when displayed, reminds the user that the microphone is on.

10.18 Alphanumeric Display Area: This is a 16-character display used for presenting time-of-day, date, digit echoing, speed call number, call forward destination, last number dialed, timed-reminder setting, call elapsed time and messages from the system.

10.19 Each character is formed from a 5x7 dot matrix.

10.20 **Prompt Display Area:** There are 35-word prompts organized into six groups. Each group relates to one of the six feature select buttons. The prompts act as a guide to the set user, and indicate to the user what can be done, and when. To select a function or feature indicated, the user only has to press the feature select button beneath the prompt.

10.21 The prompts are organized such that only one word above any feature button is displayed at any time (except for SWAP CAMP ON feature). Whenever the feature is not in the Class of Service of a particular set, or if the choices of actions are less than six, the area above some feature buttons is left blank. Pressing these buttons has no effect.

Error Messages

10.22 The data transfer between a SUPERSET 4 and the system is monitored continuously. Any problems cause an error message to be displayed by the alphanumeric display, as follows:

Message: **NO COMMUNICATION**

Meaning: This is displayed when data transfer has not occurred for at least 1 s. The set is not operational in this condition, and any set displaying this message should be reported by the user. When the problem has been corrected (refer to appropriate System Maintenance Documentation), the error message is cleared, time and date are displayed, and the set becomes operational.

Message: **CONSECUTIVE ERRORS**

Meaning: This is displayed when a series of data transfer errors has been detected by the host system. If the error occurs during a call, the audio may be lost, and the features become inoperative. If the error occurs while the set is idle, no calls can be made or received at the set. This error may be transient in nature and may disappear. When the error is cleared (refer to appropriate System Maintenance Documentation), time and date are redisplayed and the set becomes operational.

11. SUPERSETs 3 AND 4 INSTALLATION AND MAINTENANCE CONSIDERATIONS

General

11.01 Installers should not attempt to use a hand test telephone (buttinski) to check SUPERSET lines, because there is no loop detector installed in the SUPERSET line card/interface: set on/ off hook status is signaled using data transmission. SUPERSETs must not be

connected: a) to standard lines; b) in parallel; or c) as Power Fail Transfer extensions.

Installation

11.02 Installation of the SUPERSET is simplified because of the following:

- Handset and line cords are modular-connector-ended.
- No local power supply is required: power is provided by the system and distributed through the line.
- Only nonessential user programming is required, i.e., Speed Call entry, call forward destination, name, and timed reminder.
- Installer can use set display feature to identify lines programmed to appear at the set.
- Initialization of the SUPERSET occurs automatically when power is applied to the set however the line card should still be initialized (see Section MITL 9105/9110-090-500-NA).

11.03 Installation of a SUPERSET into a powered-up system consists of:

- Ensuring local modular telephone outlet is connected to a SUPERSET line card or interface.
- Connection of handset, handset cord, line cord, and main body of the SUPERSET.
- Connection of line cord to local modular jack.
- Initialize card slot.
- Verifying automatic initialization procedures have been executed; this should take 10 to 20 s. When procedures are complete, time and date are displayed.
- Identification of customer telephone number and lines appearing at the set.
- Performance of installer loop test procedures as specified in SECTION MITL9105/9110-090-320-NA for the SUPERSET 4 only: This verifies transmission and reception paths and key and display operation.

Environmental Specifications

11.04 Operating Environment:

- Ambient Temperature: 0 to 50°C (32 to 122°F).
- Ambient Humidity: 10 to 90% RH, noncondensing.

Storage/Shipping Environment:

- Ambient Temperature: -20 to 50°C (-4 to 122°F).
- Ambient Humidity: 10 to 90% RH, noncondensing.

Maintenance

11.05 No regular or scheduled maintenance is required. Performance of the installer loop test procedure (Section MITL9105/9110-090-320-NA) can be carried out at any time to check out set operation.

11.06 The installer loop test procedure, performed at the SUPERSET 4 after dialing the loop test access code, confirms correct key operation, liquid-crystal display activation, hookswitch functioning, and ringer (speaker) output.

SX-100*/SX-200*
SUPERSWITCH*
FEATURES AND SERVICES DESCRIPTION
GENERIC ACD

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1. GENERAL

Introduction

1.01 This Section contains a description of the features and services provided by the SX-100 and SX-200 Automatic Call Distribution (ACD) systems. The selection of features and services are subject to minimal constraints, allowing each system to be configured to meet the individual requirements of the customer.

Reason for Issue

1.02 This Section has been issued to provide Generic ACD information for SX-100 and SX-200 ACD systems.

1.03 Detailed instructions for the programming and testing of each feature and service are given in the following sections:

- MITL9105/9110-090-210-NA, System Programming
- MITL9105/9110-090-215-NA, System Testing.
- MITL9105/9110-090-320-NA, Extension Test Procedures.

SUPERSET 3

1.04 For information on the SUPERSET 3 see Section MITL9105/9110-090-106-NA, Features and Services Description.

SUPERSET 4

1.05 For information on the SUPERSET 4 see Section MITL9105/9110-090-107-NA, Features and Services Description.

2. FEATURES AND SERVICES DESCRIPTION

Introduction

2.01 This Part contains a description of each feature and service provided by the SX-100 or SX-200. Each description contains four parts:

- Description – a detailed description of the feature or service.
- Conditions – a list of any special conditions which should be taken into account when selecting the feature or service.
- Programming – the parameters which must be programmed to allow selection and operation of the feature or service.
- Operation – a brief description of the feature operation. In a number of supervisor feature operations, the * symbol is shown. This is the supervisor function access code (Feature Number 18) and can be programmed as any symbol or number that may be dialed from the console dial pad. Description of maintenance feature operation assumes the access code 555 (Feature Number 19) is used. SX-100/SX-200 Console Operat-

ing Instructions and SX-100/SX-200 Extension Features Operation should also be consulted.

2.02 This Section lists all feature descriptions in alphabetical order. The names of the features used refer directly to the text of the SX-100/SX-200 documentation as closely as possible, to allow direct reference from any part of the documentation.

2.03 Tables 2-1 to 2-5 list the Maintenance, Hardware, Trunk and System Features for Generic ACD.

- Trunk Answer From Any Station (TAFAS) (Night Service)

TABLE 2-1
MAINTENANCE FEATURES R2

- Customer Data Dump/Load
- Diagnostics
- Maintenance Function
- Programming and Maintenance Security
- Receiver - Busy Out
- Receiver - Direct Selection
- Remote System Reset Protection Override
- Reset the System
- Speech Path - Busy Out
- Speech Path - Direct Selection
- Test Line

TABLE 2-2
HARDWARE FEATURES R2

- Data Demultiplexer
- Dialed Activity Reporting Terminal (DART)
- E&M Trunks
- Ground Start Trunks
- Loop Start Trunks
- Recorded Announcement Cards (RAC's)
- Recorded Announcement Devices (RAD's)
- Printer and Recording Devices
- RMAT
- Reserve Power Supply
- 220 V Operation

TABLE 2-3
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- Answer Supervision Detection
- DID - Loop Dial Tie Trunks
- Dial-In Tie Trunks
- Dictation Trunks
- DID/Dial-In/CCSA
- Direct-In Lines
- Direct Inward Dial (DID) Trunks
- Direct Inward System Access (DISA)
- Failure Transfer
- Ignore Reversal
- Intercepts
- Outgoing Audio Inhibit Until Answer Supervision
- Toll Reversal
- Tie Trunks
- Trunk Groups - Two Types
- VNL - Trunks
- Wait for Dial Tone

TABLE 2-4(a)
SYSTEM OPTION CONFLICTS

System Option	108	120	131	165	218	230	231	247	248	258	276	317
113		X										
119		X								X		
121		X	X									
161	X							X				
164				X								
209						X						
217					X							
236							X					
275											X	
300									X			X

TABLE 2-4(b)
COS OPTION CONFLICTS

COS Options	48	49	58	62	80	98
45			X			
46	X	X		X		X
49	X					X
62	X	X				X
63					X	
98	X	X		X		

TABLE 2-4(c)
OTHER CONFLICTS

- System Option 169 conflicts with the Call Park feature (COS option 37).
- HOLD 4 button conflicts with the Call Blocking feature.
- FLASH button Monitor button and the SERIAL CALL button conflict
- Station Transfer Consultation Hold/Add-On conflicts with COS Options 46, 48 and 62.
- System Option 103 conflicts with COS option 41.

Only one option out of each of the following groups of System Options may be enabled at any one time:

- 125, 126, 127 (Supervisor-Timed Recall)
- 153, 154, 155 (Digit Translation Plan)
- 189, 190, 191 (Flash Timing)
- 232, 234, 235, 236 (Account Code Length)
- 255, 256, 257 (Call Forward Timeout).
- 275, 276 (Message Waiting Bell Lamp)
- 194, 195 (Message Reg Timer)
- 196, 197, 198 (Message Reg Multiplier)
- 199, 206 (Message Reg Surcharge)
- 210, 211 (Call Park Recall)
- 214, 215 (Single Digit Dialing Timeout)
- 164, 165 (Night Service Timeout)
- 128, 129 (Att Timed Recall Hold)
- 123, 124 (Att Timed Recall Camp-On)
- 217, 218 (Repeated Camp-On Tones)
- 240, 241 (ARS Dial Tone Time-Out)
- 291, 292 (First or Multi-Digit Toll Control)

TABLE 2-5
GENERIC ACD SYSTEM FEATURES AND SERVICES

R1

- Account Codes
- ACD Agent
- ACD Agent Log Access
- Alarm Indication
- ARS Allowed
- ARS Limited Access
- ARS Progress Tones - Music On Hold
- Automatic Callback Busy - (Extensions)
- Automatic Callback - Don't Answer
- Automatic Route Selection
- Automatic Station Release
- Automatic Wake-Up (Alarm Call)
- Both Button Enable
- Both Mode Standard
- Broker's Call
- Busy Lamp Field
- Busy Trunk Release
- Busy Verification
- Call Blocking
- Callback Button
- Call Forwarding - Busy (Extensions)
- Call Forwarding - Busy/Don't Answer
- Call Forwarding (System - DID, CCSA, Dial-In Tie Trunks)
- Call Forwarding - Busy/Don't Answer (System - DID, CCSA, Dial-In Tie Trunks)
- Call Forwarding - Don't Answer (Extensions)
- Call Forwarding - Follow Me
- Call Forwarding System Inhibit
- Call Hold
- Call Park
- Call Retrieve (Extensions)
- Call Selection
- Camp-On
- Can Flash if Talking to an Incoming Trunk
- Can Flash if Talking to an Outgoing Trunk
- Can Flash if Talking to an Extension
- Cannot Dial a Trunk After Flashing
- Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk
- CCSA
- Class of Service (COS)
- Common Alerting Devices (Night Bells)
- Console-less Operation
- Contact Monitor
- Control of Trunk Group Access
- Controlled Outgoing Restriction Setup
- Controlled Station Restriction (Do Not Disturb)
- CO Trunk Via Supervisor Inhibit
- Customer-Controlled Programming
- Customer Data Dump/Load
- Customer Data Print
- Data Demultiplexer
- Data Security
- Diagnostics
- Dial Access to the Supervisor
- Dialed Activity Reporting Terminal (DART)
- Dial Call Pickup
- Dial Pulse Signaling
- DID/DIAL-In/CCSA Vacant/Illegal Access Intercept to Recorded Announcement
- DID/Dial-In/CCSA Vacant/Illegal Access Intercept to Supervisor
- DID to Non-CO Trunks via Supervisor Inhibit
- Direct-In Lines
- Direct Inward Dial (DID) Trunks
- Direct Inward System Access (DISA)
- Direct Outward Dialing
- Direct to ARS
- Direct Trunk Access
- Directed Call Pickup
- Discriminating Dial Tone
- Discriminating Ringing

TABLE 2-5 (CONT'D)
GENERIC ACD SYSTEM FEATURES AND SERVICES

- Discriminating Ringing - All Calls
- Do Not Disturb
- Do Not Disturb Display
- Do Not Overflow (Trunks)
- DTMF to Rotary Dial Conversion (Tone-to-Pulse Conversion)
- Earth Ground Button
- Enable Non-CO Trunk - Trunk Connecting by Extension
- End of Dial Signal or Outgoing Trunks
- Executive Busy Override (Extensions)
- Extension Reset
- External Call Forwarding
- External Interdigit Timeout (15 Sec)
- Feature Access
- First Digit Toll Deny
- Fixed Night Service
- Flash Disable
- Flash for Supervisor
- Flexible Night Service
- Flexible Numbering Plan
- Guest Room Button
- Hands-Free Operation
- Hands-Free Operation SUPERSET 4
- Hold Pickup
- Hot Line
- Hunting
- Identified Trunk Groups
- Illegal Access Intercept to Supervisor
- Immediate Ring
- Incoming Trunk Call Rotary Only
- Individual Trunk Access
- Inhibit Automatic Supervision
- Limited Wait for Dial Tone
- Line Lockout
- Listed Directory Numbers (LDN)
- Lockout Alarm
- Maid in Room
- Manual Line
- Meet-Me Conference
- Message Registration
- Message Register Audit
- Message Waiting
- Message Waiting Display
- Message Waiting Print
- Minor Alarm Contact - see Contact Monitor
- Mixed Station Dialing
- Multi-Console Operation
- Multi-Digit Toll Control
- Multiple Extensions
- Multiple Trunk Groups with Overflow
- Music on Hold
- Music on Hold Disable
- Never a Consultee
- Never a Forwardee
- New Call Tone
- Night Bells - see Common Alerting Devices
- Night Service Automatic Switching
- No Dial Tone
- Non-CO Trunk Via Supervisor Inhibit
- Non Volatile RAM Battery Alarm
- Off Premise Extension
- Originate Only
- Outgoing Trunk Callback
- Outgoing Trunk Camp-On
- Page Button
- Paging Access (Extensions)
- Pickup Groups
- Power Failure Transfer
- Power Supply Requirements
- Printer and Recording Devices
- Printer Transmit Additional Nulls
- Printouts Extra Line Feeds (Hotel/Motel Only)
- Privacy Disable
- Programming Security
- Range Programming
- Receive Only
- Receiver - Busy Out
- Receiver Direct Selection
- Remote Maintenance Administration and Test System (RMATS)
- Remote System Reset - Protection Override
- Reserve Power Supply
- Reset the System
- Ringing Timeout 1 Minute

TABLE 2-5 (CONT'D)
GENERIC ACD SYSTEM FEATURES AND SERVICES

- Room Status Audit
- Room Status Update
- Serial Call Override Flash Button Enable
- Single Digit Dialing
- SMDR - see Station Message Detail Recording
- SMDR Overwrite Enable
- Special DISA
- Speech Path - Busy Out
- Speech Path - Direct Selection
- Speed Call
- Station Conference
- Station Message Detail Recording
- Station Override Security
- Station Transfer Consultation Hold/Add-On
- Station Transfer Security
- Store and Forward
- SUPERSET 4
- SUPERSET 4 Disconnect Alarm
- SUPERSET 4 Immediate Line Selection
- SUPERSET 4 Last Number Redial
- SUPERSET 4 Sub-Supervisor
- Supervisor Button Change Flash to Monitor
- Supervisor Button Change Flash to Serial Call
- Supervisor-Called Number Display
- Supervisor Calling Number Display
- Supervisor Calls Waiting Indicator
- Supervisor Camp-On with Indication
- Supervisor CCSA Access
- Supervisor Class-of-Service Display
- Supervisor CO Trunk - CO Trunk Connect Enable
- Supervisor Console Emergency Transfer
- Supervisor Console Flash
- Supervisor Console Ringer Codes
- Supervisor-Controlled Conference
- Supervisor Date Display
- Supervisor DISA Code Setup Enable
- Supervisor Function
- Supervisor Hold Circuits
- Supervisor Individual Trunk Access
- Supervisor Jacks
- Supervisor Lamp Test
- Supervisor Lockout
- Supervisor Non-CO Trunk - Non-CO Trunk Connect Enable
- Supervisor Secrecy
- Supervisor Serial Call
- Supervisor Station Busy Out
- Supervisor Time Display
- Supervisor Time Recall
- Supervisor Trunk Busy Out
- Switchhook Flash Timer
- System Identifier
- Tandeming - see Tie Trunks
- Test Line
- Through Dialing
- Tie Trunks
- Timed Automatic Answer Supervision
- Toll Restriction
- Toll Reversal
- Traffic Measurement
- Transfer Dial Tone
- Transfer with Privacy
- Transportable Class Of Service
- Trunk Answer From Any Station (TAFAS) Available During the Day
- Trunk Answer From Any Station (TAFAS) (Night Service)
- Trunk Busy Out Enable
- Trunk Groups
- Trunk Groups Hunting
- Trunk Lockout Alarm
- Trunk Recall Partial Inhibit
- Trunk-to-Trunk (Supervisor)
- Trunk-to-Trunk (Extensions)
- Vacant Number Intercept to the Supervisor
- Variable Timers
- Verifiable Account Codes (DISA)

Account Codes

Description

An extension may have the option, or be forced to enter an account code for trunk calls. The account code may be 1-12 digits maximum and will appear on all SMDR records (see also Section MITL9105/9110-090-451-NA), Station Message Detail Recording.

Conditions

None

Programming

- Select all relevant SMDR options as outlined in Section MITL9105/9110-090-451-NA.
- Select System Option 230 (Account Code Enable).
- Select one account code length, System Options: 232 (Account Code Length: 4 digits), 234 (Account Code Length: 8 digits), 235 (Account Code Length: 12 digits), 236 (Variable Length Account Account Codes: 1 to 12 digits). If neither of the above four options is selected (232, 234, 235, 236) the account code lenght will be 6 digits.
- To force an extension to use account codes, enable Class-of-Service Option 83 (Forced Account Code Entry) in that extension's COS.
- To allow optional entry of an account code by an extension, enable Class-of-Service Option 56 (Account Code Access) in that extension's COS.
- Assign a feature access code to Feature 31 (Account Code).

Operation

- Dial Access Code.
- Dial Account Code digits - dial tone returned.
- Dial trunk access code.
- Dial directory numbers - when the extension returns on-hook, a SMDR record will be printed including the time of the call, the trunk used and the Account Code.

ACD Agent

Description

This COS Option enables an extension to become an Agent.

Conditions

None

Programming

- Select COS Option 117 (ACD Agent).
- Select System Option 251 (ACD Enable).
- Assign a feature Access Code to feature number 47 (ACD Agent Log Access).

Refer to Section MITL9105/9110-090-222-NA, Automatic Call Distribution for additional programming information.

Operation

Refer to Section MITL9105/9110-090-222-NA, Automatic Call Distribution for ACD operation.

ACD Agent Log Access

Description

This feature when selected provides the Agent with a Log on and Log off Access Code.

Conditions

None

Programming

- Assign a feature Access Code number to feature 47 (ACD Agent Log Access).

Operation

To Log on:

- Lift handset dial ACD Agent Log Access Code.

To Log off:

- Dial ACD Agent Log Access Code – Hang Up.

Alarm Indication

Description

Each supervisor console is equipped with three alarm lamps: MIN (minor), MAJ (major) and CON (console). The minor alarm lamp, when lit, indicates that the system has detected a malfunction which has not seriously degraded the customer's service. A major alarm indicator is caused by the system detecting a failure which affects the complete system operation and indicates that a failure transfer has taken place. The console alarm is raised when a malfunction affecting the console operation is detected. If the ACD system is equipped with an optional reserve power supply, there are provisions for a "battery on" indicator. This indicator may be wired to provide a Contact Monitor alarm to alert the supervisor that the system is on battery (i.e. AC power failure). See Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation and Section MITL9105/9110-090- 500-NA General Maintenance Information.

Conditions

None

Programming

None

Operation

Major Alarm:

- MAJ alarm lamp lit, Power Failure Transfer automatically takes place, an error code may be displayed (see Table 4-4, Section MITL9105/9110-090-500-NA), General Maintenance Information.

Minor Alarm:

- MIN alarm lamp flashes, tone ringer sounds. Press and hold down console ALARM RESET button - MIN alarm lamp lights solidly, tone ringer sound stops, SOURCE and DESTINATION displays show information describing the cause of the alarm condition.

ARS Allowed

Description

If this COS Option is enabled in an extension's COS, it will allow access to a Trunk Group (not enabled in the extension's COS) if the extension is routed to that Trunk Group by ARS. That is, an extension may access a Trunk Group that is not in its COS if forced to, by the forced ARS feature. This option must be enabled if an extension is to use ARS.

Conditions

- COS Option 100 (ARS Allowed) must be enabled for an extension to use ARS.

Programming

- Select COS Option 100 (ARS Allowed)

Operation

- Dial ARS Code.
- Dial External Directory Number.

ARS Limited Access

Description

This COS Option when selected, prohibits the caller from accessing trunk groups through ARS that are not enabled in the extension's COS.

Conditions

- This COS Option is not in effect when the extension is using a common use Speed Call table.
- When this COS Option is enabled, the extension cannot access Trunk Groups directly.

Programming

- Select COS Option 116 (ARS Limited Access).

Operation

None

ARS Progress Tones – Music On Hold

Description

This feature enables a rotary station using ARS to hear music while waiting for dial tone, waiting for the digits to be outpulsed, and during pauses.

Conditions

- A music source must be provided. See Music On Hold feature in this Section.

Programming

- System Option 161 (Music On Hold Disable) must be set to "0".

Operation

None

Automatic Callback – Busy (Extensions)

Description

Automatic Callback – Busy allows an extension user, upon encountering a busy extension number (or trunk access code, see Outgoing Trunk Callback), to have the call completed when the extension becomes idle. After the feature has been activated, the system continuously monitors the originating extension and the called number. When both become idle, the system rings the originating extension, and when that extension goes off-hook, the called extension is rung. If more than one callback request is active on any number, the requests are queued and serviced on a first-in, first-out basis. All callbacks may be cancelled from the supervisor console. Automatic Callback Busy can also be used by the supervisor.

Conditions

- An individual callback cannot be cancelled by the station or the supervisor.
- A callback will always ring the originating extension; call forwarding has no effect.
- Automatic callback may be activated on extension numbers, hunt group access codes and trunk group access codes.
- Up to 30 callback requests may be active within the system at any time.
- If the two parties involved in a callback hold a conversation (not a conference) before the callback is honoured, the callback will be cancelled automatically.
- Any callback outstanding for more than 8 hours is cancelled automatically.
- Duplicate callback requests are ignored (the original callback request is cancelled).
- The callback access code must be dialed within 10 seconds of receiving busy tone.
- If a callback is not answered by the originating extension within 6 rings, it is automatically cancelled.
- If the called party becomes busy before the originating party answers a callback, the originating party will hear busy tone and may dial the callback code again.
- If a Speed Call button was used to dial the number, Automatic Callback Busy is not effective.
- The originating extension's COS must include Class-of-Service Option 33 (Automatic Callback).
- Assign a single digit access code to Feature Number 23 (Callback – Busy).
- If callback to busy trunk groups is required, select System Option 208 (Outgoing Trunk Callback).

Operation

To set up an Automatic Callback – Busy:

- Dial the required extension number or access code – busy tone is heard.
- Dial the Automatic Callback – Busy code – dial tone is returned and the dialing extension is available for normal use.

To answer an Automatic Callback – Busy:

- The extension rings.
- Lift the handset – ringing tone is returned, the called number rings an extension, or CO dial tone is returned if a callback and a trunk.

To cancel all Automatic Callback requests from the supervisor console:

- Dial *4#.
- Press the RELEASE button – all callback requests are cancelled.

Automatic Callback – Don't Answer

Description

This feature allows an extension user, upon encountering an extension which does not answer, to have the call completed after the called extension has gone off- and on-hook. After the feature has been activated, the system continuously monitors the originating extension and the required number. After the called extension goes off-hook, the callback will be handled in the same way as an Automatic Callback – Busy. If more than one callback request is active on any extension, the requests are queued and serviced on a first-in, first-out basis. All callbacks may be cancelled from the supervisor console.

Conditions

- An individual callback cannot be cancelled by the station or the supervisor.
- A callback will always ring the originating extension; call forwarding has no effect.
- Automatic callback may be activated on extension numbers and hunt group access codes but not trunks or trunk groups.
- Up to 30 callback requests may be active within the system at any time.
- If the two parties involved in a callback hold a conversation (not a conference) before the callback is honoured, the callback will be cancelled automatically.
- Duplicate callback requests are ignored (the original callback request is cancelled).
- If a callback is not answered by the originating extension within 6 rings, it is automatically cancelled.
- If the called party becomes busy before the originating party answers a callback, the originating party will hear busy tone and may dial the callback – busy code.

Programming

- Originating extension's COS must include Option Number 33 (Automatic Callback).
- Assign an access code to Feature Number 2 (Callback – Don't Answer). This code may not conflict with the system numbering plan.

Operation

To set up an Automatic Callback – Don't Answer:

- Dial the required extension number – the extension does not answer.
- Flash the switchhook – dial tone is returned.

- Dial the Callback – Don't Answer access code, and the extension number – dial tone is returned.
- Replace the handset – the extension is available for normal use.

To answer an Automatic Callback – Don't Answer:

- The extension rings.
- Lift the handset – ringing tone is returned, the called number rings.

To cancel all Automatic Callback requests from the supervisor console:

- Dial *4#.
- Press the RELEASE button – all callback requests are cancelled.

Automatic Route Selection (ARS)

Description

The Automatic Route Selection (ARS) feature simplifies the dialing of long-distance calls by PABX users, by automatically selecting the most optimum route for the time of day, and by automatically inserting and/or deleting the proper routing digits to obtain the desired party. If all routes are used except the last (generally most expensive) the user will receive 3 short warning tones followed by a 5 second pause to indicate that the last route is being used. Three schedules can be selected to limit a statin's access to ARS (depending on time of day). Further information is contained in Section MITL9105/9110-090-213-NA, Automatic Route Selection.

Conditions

- Saved Number Redial may not be used with ARS.

Programming

- The extension's COS must contain COS Option Number 100 (ARS Allowed).
- Select System Option 238 (Automatic Route Selection Enable).
- Select System Option 242 (ARS Unrestricted Office Code Enable) if CO codes of the form NNX are to be recognized in the local or home area.
- Select COS Option 96 (ARS Restricted) as required to restrict Class-of-Service members to certain trunk routings.
- Select Feature Number 44 (ARS Access Code).
- Select COS Option 118 (ARS Most Expensive Route Beep) as required to indicate that the most expensive route has been chosen.
- Select COS Option 113 (Disallow ARS Schedule A).
- Select COS Option 114 (Disallow ARS Schedule B).
- Select COS Option 115 (Disallow ARS Schedule C).

If the user has long-distance "Dial 0" capability, select one of the following System Options: for a 5 s Dial 0 time-out, select System Option 240 (ARS Dial 0 Time-out 5 s), or for a 10 s time-out, select System Option 241 (ARS Dial 0 Time-out 10 s). This will enable the ACD to differentiate between Dial 0 calls and long-distance "Dial 0" calls.

- See Section MITL9105/9110-090-213-NA, Automatic Route Selection, for other details and ARS Allowed.

Operation

If System Option 242 is not set:

- Dial ARS code
- Dial 7- or 10-digit number. Route and required routing digits are automatically selected.

If System Option 242 is set (ARS Unrestricted Office Code Enable), dial ARS code followed by:

- Dial 1-N 1/0 X for long-distance.
- Dial N for local calls.

*N= digits 2 to 9
X= digits 0 to 9

Automatic Wake-Up (Alarm Call)

Description

This feature allows either the supervisor or an extension user to set up a Wake-Up alarm call that will ring the extension at a prearranged time. After answering a Wake-Up alarm call, the extension user receives either a special tone (100 ms on, 400 ms off, of miscellaneous tone), music, or a Recorded Announcement. If the call is not answered within six rings, or if the extension is busy, the call will repeat two more times at 5 minute intervals.

Conditions

- A Wake-Up call will be delayed if there are ten Wake-Up calls in the ringing state or if there are only four free speech paths. The remaining Wake-Up call(s) will be initiated as soon as conditions allow.
- An extension with "Do Not Disturb" will be overridden and rung at the requested time.
- System Option 300 (Traffic Measurement Polling) and System Option 248 (Automatic Wake-Up Print) are mutually exclusive.
- If a power failure occurs when the system is reset, then all wake-ups within the previous 2 hour period (by the new time setting) will be honored within 5 minutes.
- If a power failure occurs for a period in excess of 24 hours, all wake-ups should be cancelled, because the system will remember the time but the date is not stored. The wake-up call when answered may be connected to an external recording device for a specific recorded announcement (see recorded announcement).
- Select System Option 245 (Automatic Wake-Up Enable) if the Wake-Up call is to be set from the console. To have a minor alarm raised at the console if a Wake-Up is not answered after three attempts, select System Option 246 (Automatic Wake-Up Alarm to Supervisor Enable).
- For a printed copy of all Wake-Up requests and attempts, select System Option 248 (Automatic Wake-Up Print).
- A Wake-Up/Alarm call may be answered using Dial or Directed Call Pickup. Once answered, the Wake-Up/Alarm call is cancelled.
- For music when the Wake-Up call is answered, select System Option 247 (Automatic Wake-Up MOH).
- For an extension to set Automatic Wake-Up, select Class-of-Service Option Number 82 (Alarm Call Enable).
- For an extension to set Automatic Wake-Up, assign an access code to Feature Number 30 (Alarm Call).

Operation

For A Recorded Announcement when the Wake-Up call is answered:

- Dial ⁎234 at the console

- Dial the Recording Group Access Code

To delete an existing Automatic Wake-Up Recording:

- Dial ⁎234 at the console
- Dial #

To set or modify a Wake-Up call from the console:

- Press the GUEST ROOM button – the GUEST ROOM lamp lights.
- Dial the extension number – the DESTINATION display shows the Wake-Up time.
- Dial ⁎, the Wake-Up time, then # (or ⁎ if p.m. and a 12-hour clock is used) – the DESTINATION display shows the Wake-Up time.
- Press the RELEASE button, or to return to the extension you may press the GUEST ROOM button to return to the source party.

To cancel a Wake-Up call from the console:

- Press the GUEST ROOM button – the GUEST ROOM lamp lights.
- Dial the extension number – the DESTINATION display shows the Wake-Up time.
- Dial ⁎# – DESTINATION display clears.
- Press the RELEASE button, or GUEST ROOM button to return to the source party.

To set or modify a Wake-Up call from an extension:

- Dial the access code and desired Wake-Up time as a 4-digit number using the 24-hour clock – dial tone is returned.

To cancel a Wake-Up call from an extension:

- Dial the access code, followed by 9999 – dial tone is returned.

After three wake-up attempts a minor alarm will appear at the console. The SOURCE display will show E088 and the equipment number. The DESTINATION display will show the extension number and nA.

Should the printer be suspended (⁎14⁎) for an extended period of time, the print buffer may fill up. If the print buffer fills up, a minor alarm will be raised, SOURCE display will show E098 and the DESTINATION display will show Prntr.

Both Button Enable

Description

Selecting this option enables the supervisor console BOTH button. In normal console operation (automatic split mode), the console is connected either to the source or destination party of a call. Pressing the BOTH button allows the supervisor to speak to both the calling and called parties at the same time. See also Both Mode Standard.

Conditions

- In the Both mode of operation, the Do Not Disturb and Message Waiting indications are those of the DESTINATION party.

Programming

- Select System Option 101 (Both Button Enable).

Operation

With the console operating in the automatic split mode:

- Press the BOTH button – the SOURCE display shows the number of the source party, the DESTINATION display shows the number of the destination party, the supervisor is connected to both parties.

Both Mode Standard

Description

When selected, this option causes the supervisor to be normally connected to both the Source and Destination parties on all calls through the console. Manual splitting may still be achieved using the console SOURCE and DEST buttons. If this option is not selected, the supervisor will be connected to the Source party on answering the call, and to the Destination party as soon as the destination number is dialed (Automatic Split Mode). See also Both Button Enable.

Conditions

- When this option is in effect, the console displays reflect the status of the destination party for Do Not Disturb and Message Waiting.

Programming

- Select System Option 102 (Both Mode Standard).

Operation

None

Broker's Call

Description

The Broker's Call allows an extension user, while engaged in a call, to hold the first call and originate a new call. Once the new call has been established, the originating extension may alternate between the calls, and carry on a PRIVATE conversation with either party. If the extension originating the Broker's Call hangs up with a party on hold, the extension will be rung back by the held party (see also Transfer with Privacy).

Conditions

- An extension with the Broker's Call feature may access the Call Park, Call Hold, Call Hold and Retrieve, and Paging features after flashing on a call.
- The originating extension and only one of the other parties may be in the talking connection at any time.
- COS Option Number 48 (Broker's Call) and Option Number 49 (Station Conference) are mutually exclusive. COS option 48 (Broker's Call) and Option number 98 (Transfer with Privacy) are mutually exclusive.
- System Options 183 (Cannot Dial a Trunk after Flashing) and 184 (Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk) do not apply to an extension with Broker's Call.

Programming

- The COS of the extension originating the Broker's Call must contain Option Number 48 (Broker's Call).
- One or more of the System Options 181 (Can Flash if Talking to an Incoming Trunk), 182 (Can Flash if Talking to a Outgoing Trunk) and 180 (Can Flash if Talking to a Station), must be selected in conjunction with Broker's Call.

Operation

- After establishing a call, flash the switchhook – transfer dial tone is returned.
- Dial the number of the second party – when the second party answers, 2-way private conversation.
- To alternate between calls, flash the switchhook – private conversation with the other party.

Busy Lamp Field

Description

Each supervisor console is equipped with an Equipment Status Lamp Field which displays the busy/idle state of any of 200 selected trunks or extensions. The Busy Lamp Field can also display the status of assigned extensions. (See Do Not Disturb, Message Waiting Display, Busy Verification, Room Status, Automatic Station Release, and Maid in Room.)

Conditions

- Multiple assignment of a busy lamp is not permitted.

Programming

- Enter the busy lamp number to be associated with the extension or trunk when programming the item.
- Attach the required designation strip to console.

Operation

None

Busy Trunk Release

Description

This feature allows the supervisor or repair person to release a trunk that has been busied out from the console.

Conditions

None

Programming

- Assign an access code to Feature Number 18 (Supervisor Function).
- Select System Option 130 (Supervisor Trunk Busy-Out Enable).

Operation

- Dial *9.
- Dial the Individual Trunk access code (trunk equipment number).
- Dial #.
- Press the RELEASE button – the trunk is idle.

Busy Verification

Description

This feature allows the supervisor to view the busy/idle status of lines and trunks using the Busy Lamp Field. The Busy Lamp Field is a standard feature. The supervisor may further investigate apparent busy conditions by using the Busy Override feature.

Conditions

- For an extension to be displayed, it must have a lamp assigned to it.
- Only one extension or trunk per lamp can be assigned.

Programming

- Assign the trunk or extension to the required busy lamp position during programming.

Operation

None

Call Announce Override

Description

Selection of this Class-of Service Option allows a SUPERSET 4 user, when calling another SUPERSET 4, to make a call announcement if the called set is busy.

Conditions

- The called set must be equipped for call announcement.

Programming

- Select Class-of-Service Option 102 (Call Announce Override).
- For single line types select Class of Service Options 40 (Executive Busy Override) and 102 (Call Announce Override).

Operation

- If the called SUPERSET 4 line is busy, and is equipped with the call announce feature, and the caller is a SUPERSET 4 then the caller OVERRIDE softkey will be indicated. Press the key, and make the required announcement.
- If the caller is a single line type, dial the Executive Busy Override Access Code - after the warning tone you are connected to the call announcement port.

Call Blocking

Description

This feature allows the supervisor to restrict extensions with "Hotel/Motel Station-to-Station Restriction Applies" in their COS, from making calls to other extensions with the same option, by activating Call Blocking. Calls to the supervisor or to extensions without the option selected may be made normally. During Day Service, calls made between restricted extensions are intercepted to the supervisor or receive reorder tone. During Night Service, interception is to reorder tone only.

Conditions

- An extension with COS Option Number 63 (Hotel/ Motel Station-to-Station Restriction Applies) set may call an extension without Option Number 63 while Call Blocking is in effect.
- An extension without Option Number 63 set may call an extension with Option Number 63 set while Call Blocking is in effect.

Programming

- Select System Option 105 (Supervisor Call Block Enable - HOLD Button 4).
- Select System Option 136 (Intercept to Sup.-Illegal Access) may be selected. If this option is not selected, blocked calls will intercept to reorder tone.
- The COS of the extension to be blocked must include Option Number 63 (Hotel/Motel Station-to-Station Restriction Applies).

Operation

To set up Call Blocking:

- Press the CALL BLOCK button - the CALL BLOCK lamp lights, all calls are blocked between extensions with Option Number 63 in their COS.
- Press the RELEASE button.

To remove Call Blocking:

- Press the CALL BLOCK button - the CALL BLOCK lamp goes out, Call Blocking is removed.
- Press the RELEASE button.

Callback Button

Description

Selection of this feature allows the supervisor to set up a Don't Answer or Busy Callback by pressing the CALLBACK button.

Conditions

- Automatic Callback may be activated on extension numbers, hunt group access codes and trunk group access codes.
- Up to 30 callback requests may be active within the system at any time.
- If the two parties involved in a callback hold a conversation (not a conference) before the callback is honoured, the callback will be cancelled automatically unless it was set by the supervisor.
- Any callback outstanding for more than 8 hours is cancelled automatically.
- Duplicate callback requests are ignored (the original callback request is cancelled).
- The CALLBACK button must be depressed while receiving ring-back or busy tone.
- If the called party becomes busy before the supervisor answers a callback, the supervisor will hear busy tone and may press the CALLBACK button again. The supervisor may cancel all callback requests by dialing *4 #.
- All callback requests are lost after recovery from a power failure.
- Automatic Callback requests wil not take effect if the number was dialed using a Speed Call button.

Programming

- Select System Option 104 (Callback Button Enable).

Operation

On reaching a busy or unanswered number:

- Press the CALLBACK button.
- Press the RELEASE button – the console displays clear, the console will be called when the number becomes free for a busy number or when an extension has gone off- and on-hook for a Callback Don't Answer.

To answer a CALLBACK RECALL:

- Press the ANSWER button – ANSWER and CALLBACK lamps light.
- Listen for ringing tone – the RECALL lamp goes out, the DESTINATION display shows the number and Class of Service of the extension and the console is connected to the ringing extension.

Call Forwarding – Busy (Extensions)

Description

This feature allows a user to have all calls that are directed to his extension, forwarded to the supervisor, to a selected extension number within the ACD system, or to a selected external number, WHEN THE EXTENSION IS BUSY. While the feature is active and the extension is idle, calls may be made and received normally

Conditions

- Callbacks will always ring the originating extension, call forwarding has no effect.
- Call forwarding has no effect on calls directed to an extension via hunting.
- Only one type of Call Forwarding code may be active on each extension at any time. If an extension has one type of Call Forwarding code active and the user enters a new Call Forwarding code, the first type of forwarding is cancelled.
- Calls may not be forwarded to extensions with a COS that includes Option Number 38 (Never a Forwardee).
- The supervisor cannot forward calls that are directed to the console.
- Calls may be forwarded a maximum of two steps, once at the dialing stage (Call Forwarding – Follow Me or Call Forwarding – Busy), and once after ringing (Call Forwarding – Don't Answer).
- Calls will not be forwarded to the supervisor during Night Service.
- If an invalid number is selected as a forwarding number, reorder tone is returned.
- Call forwarding does not apply if the calling extension (or supervisor) is the party to which the call would be forwarded.
- Extension call forwarding takes precedence over system call forwarding.

Programming

- Assign an access code to Feature Number 3 (Call Forwarding – Busy). This code cannot conflict with the system numbering plan.
- The COS of the forwarding extensions must contain Option Number 34 (Call Forwarding – Busy).

Operation

To select Call Forwarding – Busy:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding – Busy access code.
- Dial the number to which calls are to be forwarded – dial tone is returned.

- The extension is available for normal use.

To cancel Call Forwarding - Busy:

- Lift the handset - dial tone is returned.
- Dial the Call Forwarding - Busy access code - no tone is returned.
- Replace the handset.

To cancel all Forwarding requests from the console:

- Dial ⁎1# and press the RELEASE button

To cancel a Forwarding request for an extension from the console:

- Dial ⁎11 nnn # (where nnn is the extension number), and then press the RELEASE button.

Note: - nnn may also be the Supervisor access code.
- see also External Call Forwarding.

Call Forwarding – Busy/Don't Answer (Extensions)

Description

This feature allows a user to have all calls which are directed to his extension, forwarded to the supervisor or to a selected extension number within the ACD system WHEN THE EXTENSION IS BUSY or NOT ANSWERED WITHIN THE SELECTED TIME. While the feature is active and the extension is idle, calls may be made and received normally.

Conditions

- Callbacks will always ring the originating extension, call forwarding has no effect.
- Call forwarding has no effect on calls directed to an extension via hunting.
- Only one type of Call Forwarding code may be active on each extension at any time. If an extension has one type of Call Forwarding code active and the user enters a new Call Forwarding code, the first type of forwarding is cancelled.
- Calls may not be forwarded to trunks or numbers external to the ACD system except by External Call Forwarding.
- Calls may not be forwarded to extensions with a COS that includes Option Number 38 (Never a Forwardee).
- The supervisor cannot forward calls that are directed to the console.
- Calls may be forwarded a maximum of two steps, once at the dialing stage (Call Forwarding – Follow Me or Call Forwarding – Busy), and once after ringing (Call Forwarding – Don't Answer).
- Calls will not be forwarded to the supervisor during Night Service.
- If an invalid number is selected as a forwarding number, reorder tone is returned.
- Call forwarding does not apply if the calling extension (or supervisor) is the party to which the call would be forwarded.
- Extension call forwarding takes precedence over system call forwarding; i.e. extension call forwarding is tested initially, then system call forwarding with extension call forwarding being honored first.

Programming

- Assign an access code to Feature Number 46 (Call Forwarding – Busy/Don't Answer). This code cannot conflict with the system numbering plan.
- The COS of the forwarding extensions must contain Option Numbers 35 (Call Forwarding Don't Answer) and 34 (Call Forwarding Busy).

Operation

To select Call Forwarding – Busy/Don't Answer from an extension:

- Lift the handset – dial tone is returned.

- Dial the Call Forwarding – Busy/Don't Answer access code.
- Dial the number (or Speed Call Access Number, Entry Number) to which calls are to be forwarded – dial tone returned.
  - The extension is available for normal use.

To select Call Forwarding – Busy/Don't Answer from the console:

- Dial ⁎11, extension number to be forwarded, 4 and extension number to which calls are to be forwarded.
  - The extension is available for normal use.

To cancel Call Forwarding – Busy/Don't Answer:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding – Busy/Don't Answer access code – no tone is returned.
- Replace the handset.

To cancel all Forwarding requests from the console:

- Dial ⁎1#.

To cancel a Forwarding request for an extension from the console:

- Dial ⁎11 nnn # (where nnn is the extension number) and then press the RELEASE button.

Call Forwarding – Busy (System – DID, CCSA, Dial-In Tie Trunks)

Description

This feature allows a customer to specify that all DID, CCSA and Dial-In Tie Trunk calls directed to a busy extension will be forwarded to the supervisor. The forwarded calls will appear at the supervisor console as RECALL.

Conditions

- Call Forwarding – Busy System feature is not active during Night Service.
- Extension call forwarding takes precedence over system call forwarding; i.e. extension call forwarding is tested initially, then system call forwarding with extension call forwarding being honored first.
- Calls to extensions with Option Number 81 (Call Forwarding System Inhibit) in their COS will not be forwarded.

Programming

- Select System Option 253 (Call Forwarding – Busy, System, DID, Dial-In, Tie Trunk, CCSA). If this option is not selected, Dial-In calls to busy extensions will receive busy tone.

Operation

None

Call Forwarding – Busy/Don't Answer (System – DID, CCSA, Dial-In Tie Trunks)

Description

This feature allows a customer to specify that all DID, CCSA and Dial-In Tie Trunk calls directed to a busy extension (or one which does not answer within a selected time period) will be forwarded to the supervisor. The forwarded calls will appear at the supervisor console as RECALL.

Conditions

- Call Forwarding – Don't Answer (System, DID, Dial-In Tie Trunk, CCSA) is not active during Night Service.
- Extension call forwarding takes precedence over system call forwarding; i.e. extension call forwarding is tested initially, then system call forwarding with extension call forwarding being honored first.
- Calls to extensions with Option Number 81 (Call Forwarding System Inhibit) in their COS will not be forwarded but will continue to ring at the extension.

Programming

- Select System Option 254 (Call Forwarding – Don't Answer (System, DID, Dial-In Tie Trunk, CCSA)).

Operation

None

Call Forwarding – Don't Answer (Extensions)

Description

This feature allows an extension user to have all calls directed to the extension that are not answered within a selected time to be forwarded to the supervisor or to another extension number specified. The forwarded calls will appear at the supervisor console as RECALL (see also Call Forwarding Busy/Don't Answer).

Conditions

- Extension call forwarding takes precedence over system call forwarding.
- Callbacks will always ring the originating extension – call forwarding has no effect.
- Only one type of Call Forwarding code may be active on an extension at any time. If an extension has one type of Call Forwarding active and the user enters a new Call Forwarding code, the first type of forwarding is cancelled.
- Calls may not be forwarded to trunks or numbers external to the ACD system except for extensions which have External Call Forwarding enabled.
- Calls may not be forwarded to extensions with a COS that includes Option Number 38 (Never a Forwardee).
- Calls may be forwarded a maximum of two steps, once at the dialing stage (Call Forwarding – Follow Me or Call Forwarding – Busy), and once after ringing (Call Forwarding – Don't Answer).
- Call Forwarding does not apply if the calling extension (or supervisor) is the party to which the call would be forwarded.
- Call will not be forwarded to the supervisor during Night Service.
- If an invalid number is selected as a forwarding number, reorder tone is returned.
- The supervisor cannot forward calls that are directed to the console.

Programming

- Assign an access code to Feature Number 4 (Call Forwarding – Don't Answer).
- If calls are to be forwarded after 10 s, select System Option 255.
- If calls are to be forwarded after 20 s, select System Option 256.
- If calls are to be forwarded after 40 s, select System Option 257.
- If none of System Options 255, 256 nor 257 is selected, calls are forwarded after 30 s (default time-out).

Operation

To select Call Forwarding – Don't Answer:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding – Don't Answer access code.
- Dial the supervisor access code, or the number of the extension to which the calls are to be forwarded – dial tone is returned.

- The extension is now available for the origination and reception of calls.

To cancel Call Forwarding – Don't Answer:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding – Don't Answer access code – no tone is returned.
- Replace the handset – call forwarding is cancelled.

To cancel all Call Forwarding requests from the console:

- Dialing ⁎1 # and then press the RELEASE button.

Call Forwarding – Follow Me

Description

This feature allows an extension user to have all calls which are directed to the extension, to be forwarded to the supervisor or a selected extension within the ACD system. The number to which the calls are forwarded is the only originating party that may call the forwarding extension while Call Forwarding – Follow Me is active. The forwarding extension may originate calls in the normal manner. Extension call forwarding takes precedence over system call forwarding (see also External Call Forwarding).

Conditions

- Callbacks will always ring the originating extension – Call Forwarding has no effect.
- Call Forwarding has no effect on calls directed to the extension via hunting.
- Only one type of Call Forwarding code may be active on an extension at any time. If an extension has one type of Call Forwarding active and the user enters a new Call Forwarding code, the first type of forwarding is cancelled.
- Calls may not be forwarded to extensions with a COS that includes COS Option Number 38 (Never a Forwardee).
- Calls may be forwarded a maximum of two steps, once at the dialing stage (Call Forwarding – Follow Me or Call Forwarding – Busy), and once after ringing (Call Forwarding – Don't Answer).
- Call Forwarding does not apply if the calling extension (or supervisor) is the party to which the call would be forwarded.
- Calls will not be forwarded to the supervisor during Night Service.
- If an invalid number is selected as a forwarding number, reorder tone is returned.
- The supervisor cannot forward calls that are directed to the console.
- Calls will not be forwarded to the console during Night Service.

Programming

- Assign an access code to Feature Number 5 (Call Forwarding – Follow Me).
- The COS of the forwarding extension must include Option Number 36 (Call Forwarding – Follow Me).

Operation

To select Call Forwarding – Follow Me:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding – Follow Me access code.
- Dial the number to which the calls are to be forwarded (extension number or the supervisor) – dial tone is returned.

- Replace the handset – the extension is available for call originations.

To cancel Call Forwarding – Follow Me:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding – Follow Me access code – no tone is returned.
- Replace the handset – all forwarding is cancelled.

To set up Call Forwarding – Follow Me for an extension from the console:

- Dial ⁎11 nnn (where nnn is the extension number) + 3.
- Dial number of extension to which callers are to be forwarded.
- Press the RELEASE button.

To cancel all Call Forwarding requests from the console:

- Dial ⁎1# and then press the RELEASE button.

To cancel a Call Forwarding request for an extension from the console:

- Dial ⁎11 nnn # (where nnn is the extension number), then press the RELEASE button.

Call Forwarding System Inhibit

Description

This feature allows System Call Forwarding to be inhibited on an extension basis. If a DID, CCSA or Dial-In Tie Trunk call is directed to an extension with this feature active, the calling party will continue to hear ringing (extension idle) or busy tone (extension busy); the call will not be forwarded to the supervisor.

Conditions

None

Programming

- To inhibit Call Forwarding, the COS of the extension must include Option Number 81 (Call Forwarding System Inhibit).

Operation

None

Call Hold

Description

Call Hold allows an extension user engaged in an active call, to place the call on hold, then to replace the extension handset or use the extension for other calls. All features normally active on the extension may be selected while the call is held. The held call may be retrieved locally or remotely (from a different extension) by dialing the required Call Hold Retrieve code. A held call may be retrieved as part of consultation hold or conferencing. The extension may interchange the held call with an active call or conference the two calls. If the held call is not retrieved within the selected recall time, the holding extension is automatically recalled. For SUPERSET 4 see Section MITL9174-518-105-NA.

Conditions

- Conference calls may not be held.
- If the user has a trunk on "Consultation Hold", and the held party is a trunk, System Option 183 (Cannot Dial a Trunk After Flashing) and System Option 184 (Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk) apply to the holding extension.

Programming

- Assign access codes to Feature Numbers: 25 (Call Hold), 26 (Local - Retrieve) and 27 (Remote Retrieve).
- The COS of the holding extension must include Option Number 79 (Call Hold and Retrieve Access).
- Select System Option 210 for a recall time of 2 minutes or System Option 211 for a recall time of 4 minutes. If neither of these options is selected, the recall time will be 3 minutes.

Operation

To place a call on hold:

- Flash the switchhook - transfer dial tone.
- Dial the Call Hold code - dial tone is returned, the original call is held and hears music, if provided. The holding extension may make or receive calls or access features in the normal manner.

To retrieve the call locally (at the holding extension):

- Dial the Local Retrieve code - you are connected to the held call.
- The call is returned to the holding extension.

To retrieve the call remotely (at a remote extension):

- Dial the Remote Retrieve code.
- Dial the number of the holding extension - the call is connected to the remote extension.

Call Park

Description

This feature allows an extension user to park an active call and replace the extension handset. The call may be retrieved at the extension at which the call was parked, or at any remote extension within the system. The parked party hears music while the call is parked, or nothing if Music on Hold is not employed.

If a parked call is not retrieved within the selected recall time (2, 3 or 4 minutes), the parking extension is rung. If the parked call was a trunk call and the extension does not answer the recall within the selected recall time-out period (20, 30 or 40 seconds), the parked call will be routed to the supervisor console and will appear as a RECALL. If the parked call was an internal call, the parking extension will continue to ring until it is answered, or until the parked extension goes on-hook.

Conditions

- A parking extension cannot originate or answer calls while the call is parked but may access the paging equipment after dialing the Call Park code.
- The supervisor cannot park calls.
- The selected Don't Answer recall time-out applies to Call Park recall time-out.
- During Night Service a parked trunk call is not routed to the supervisor but continues to ring at the parking extension.
- System Option 169 (Trunk Recall Partial Inhibit) and Call Park are mutually exclusive.

Programming

- Assign an access code to Feature Number 6 (Call Park).
- The COS of the extension must include Option Number 37 (Call Park).
- If remote pickup of the parked call is required, the extension's COS must contain Option Number 39 (Directed Call Pickup).
- If System Option 210 is selected, the Call Park recall time is 2 minutes.
- If System Option 211 is selected, the Call Park recall time is 4 minutes.
- If neither Option 210 nor Option 211 is selected, the recall time is 3 minutes (default time).
- System Option 181 (Can Flash if Talking to an Incoming Trunk), System Option 182 (Can Flash if Talking to an Outgoing Trunk) and System Option 180 (Can Flash if Talking to an Extension) must be enabled as required.

Operation

To Park a call:

- Flash the switchhook – dial tone returned.
- Dial the assigned Call Park access code – dial tone returned. Replace the handset, or access the paging equipment and make an announcement, then replace handset.

To retrieve the Parked call at the Parking extension:

- Lift the handset – you are connected to the call.

To retrieve the Parked call from a different extension:

- Lift the handset, dial the Directed Call Pickup code, then dial the extension number at which the call was parked – you are connected to the call.

Note: This feature is not applicable to SUPERSETs.

Call Retrieve (Extensions)

Description

Calls may be parked or held (see Call Park and Call Hold) and retrieved either locally or remotely by an extension. For further information see Call Hold or Call Park.

Conditions

None

Programming

None

Operation

None

Call Selection

Description

This feature allows the supervisor to answer calls either in the order in which they arrive at the console, or by selecting a specific call type. As calls arrive at the console, they are queued and the LED associated with the call flashes. The supervisor may answer the first call in the console queue by pressing the ANSWER button, or may select a call of a specific type by pressing the button associated with the flashing LED. The LED's associated with the calls remaining in the supervisor queue continue to flash. Six incoming call indicators are provided, identifying the following call types:

- DIAL 0 – calls from extensions.
- RECALL – recalls.
- LDN 1-4 – These buttons may be assigned to incoming trunks, in order to arrange the trunks in up to four different groups as required. Additional button labels are provided to identify these four buttons as TIE, WATS, FX or LDN type calls.

Conditions

- Assignment of trunks to LDN buttons is arbitrary. All trunks may be on one button, or they may be distributed across all four buttons as required. DID or CCSA trunks that dial the operator code (Alternate Supervisor Access Code) will appear on LDN 4.

Programming

- Each Non Dial-In Trunk which appears on the console is assigned an LDN number. This number identifies on which button incoming calls will appear (LDN 1-4).

Operation

To answer the first call in the supervisor queue:

- Press the ANSWER button – the tone ringer stops, the LED associated with the call type lights steadily, the SOURCE display shows the number of the calling trunk or extension, and the supervisor is connected to the calling party.

To answer a specific call type:

- Press the button associated with the desired call type – the tone ringer stops, the LED below the button lights steadily, the SOURCE display shows the number of the originating party, and the supervisor is connected to the calling party.
- For a visually impaired supervisor the type of incoming call may be identified by a distinctive audible sequence given by the console ringer. See Supervisor Console Ringer Codes for details of this feature.

Camp-On

Description

When an extension user who is equipped with the Camp-On option reaches a busy extension, hunt group or trunk group and remains off-hook for 10 seconds, it will be camped-on to the busy equipment. At this time, a special busy tone is received (350/440 Hz interrupted at 60 ipm) and the called equipment receives a Camp-On tone (a single burst of 440 Hz tone for 200 ms or a double burst if a trunk) if it is not dialing or listening to a tone. When the busy equipment hangs up, the calling extension receives ringback tone and the (formerly busy) equipment is rung. The supervisor or an extension may also transfer a call into busy (camp the call onto a busy extension). In addition, by enabling COS Option 107 (Repeated Camp-On Beeps), the call will not be recalled to the console after the time-out, but will remain camped-on until the camped-on party hangs up or the caller hangs up. The camped-on party (while engaged) will receive a double camp-on tone every 5 seconds till the caller hangs up or the camped-on party hangs up.

Conditions

- Camp-On tone is not applied to trunks or stations using paging equipment.
- Extensions cannot camp-on to paging equipment.
- Extensions with COS Option Number 41 (Data Security) may be camped-on to, but do not receive Camp-On tone.
- If the called extension is on Hold and Music on Hold is provided, the music is removed while the Camp-On tone is applied.
- An extension on Hold will receive a Camp-On tone.

Programming

- The COS of the extension must include Option Number 51 (Camp-On) in its COS.
- To Camp-On to a trunk group, COS Option Number 51 and System Option 209 (Outgoing Trunk Camp-On) must also be selected. For repeated Trunk Camp-on Beeps every 5 seconds, select System Option 217 (Repeated Camp-on Tone 5 s). For Repeated Trunk Camp-on Beeps every 15 seconds select System Option 218 (Repeated Camp-on Tone 15 s).

Operation

Camp-On:

- Dial the number - busy tone is returned.
- After 10 seconds of special busy tone, the called extension receives Camp-On tone.
- The busy extension goes on-hook - the calling extension hears ringing tone, the called extension is rung.
  OR

- The called trunk becomes idle – the calling extension is connected to the trunk.

Transfer into Busy:

- Flash the switchhook – dial tone returned, call is on soft hold.
- Dial the extension to transfer the call, then hang up – the call on hold remains on hold until the called extension hangs up. The called extension is rung when it goes on-hook and the call on hold receives ringback tone.

The supervisor may perform the same operation but is not required to put the caller on hold (see Console Operator's Manual).

Can Flash if Talking to an Incoming Trunk

Description

When selected, this option allows extension users to flash the switchhook while connected to an incoming trunk. This enables the trunk call to be Transferred, Held, Parked or Added to a conference.

Conditions

- This option will be disabled if the extension has Option Number 46 (Flash Disable) in its COS.
- If the COS of an extension contains Option Number 62 (Flash for Supervisor), flashing the switchhook results in the call being presented to the Supervisor. See Flash for Supervisor.

Programming

- Select System Option 181 (Can Flash if Talking on an Incoming Trunk).

Operation

None

Can Flash if Talking to an Outgoing Trunk

Description

When selected, this option allows extension users to flash the switchhook while connected to an outgoing trunk. This enables the trunk call to be Transferred, Held, Parked or Added to a conference.

Conditions

- This option will be disabled if the extension has Option Number 46 (Flash Disable) in its COS.
- If the COS of an extension contains Option Number 62 (Flash for Supervisor), flashing the switchhook results in the call being presented to the supervisor. See Flash for Supervisor.

Programming

- Select System Option 182 (Can Flash if Talking to an Outgoing Trunk).

Operation

None

Can Flash if Talking to an Extension

Description

This option allows an extension user to flash the switchhook while talking to an extension. This enables the extension to Hold, Park, Transfer or Enter the internal call into the conference.

Conditions

- This option will be disabled if the extension has Option Number 46 (Flash Disable) in its COS.
- If the COS of an extension contains Option Number 62 (Flash for Supervisor), flashing the switchhook results in the call being presented to the supervisor. See Flash for Supervisor.

Programming

- Select System Option 180 (Can Flash if Talking to an Extension).

Operation

None

Cannot Dial a Trunk After Flashing

Description

These options inhibit an extension from accessing a trunk after flashing the switchhook. The System Option applies the restriction to all extensions; if only certain extensions are to be restricted the extension COS must include the relevant COS option.

Conditions

- If the user has a trunk on "Consultation Hold", the "Cannot Dial a Trunk After Flashing" and "Cannot Dial a Trunk After Flashing if Holding or in a Conference with a Trunk" options apply.
- This option does not apply to extensions with Option Number 48 (Broker's Call) in their COS.

Programming

- Select System Option 183 (Cannot Dial a Trunk After Flashing) for system-wide restriction, or select COS Option 94 (Cannot Dial a Trunk After Flashing) for each extension to be restricted.

Operation

None

Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk

Description

This system option prevents extensions from holding a trunk call by flashing the switchhook, then dialing a second trunk.

Conditions

- This option does not apply to extensions with Option Number 48 (Broker's Call) in their COS.

Programming

- Select System Option 184 (Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk).

Operation

None

CCSA

Description

The system can accommodate Common Control Switching Arrangement trunks. These trunks are similar to DID trunks in all respects except that they are considered to be Non-CO trunks and may be used as bothway trunks.

Conditions

- If the CCSA trunk sends less digits than expected, the trunk will receive reorder tone after the interdigit time-out (15 s).
- Extra digits sent are ignored.
- CCSA trunks may access extensions, hunt groups or the supervisor. Incoming CCSA trunks are rotary dial only.
- An extension with COS Option 43 (Inward Restriction DID) or COS Option 44 (Originate Only) in its COS cannot receive a call directly from a DID trunk.
- CCSA trunks may only dial numbers that are exactly the correct length (incoming length minus the number of digits absorbed).
- An Incoming CCSA Trunk may not access a Trunk Group.
- CCSA trunks may not be externally forwarded.
- CCSA trunks may not call or be forwarded to hands-free extensions.

Programming

- When programming the trunk the entry made after pressing the I/C (Incoming Digits) button may consist of two or three digits.
  - First Digit - specifies the number of incoming digits (1-9).
  - Second Digit - the number of leading digits to be absorbed (0-8).
  - Third Digit, if required - the actual digit to be prefixed to the incoming number after absorption (0-9). The maximum number of digits permitted after absorption and adding the prefix digit is four.
- Trunk Type must be specified as 'type' 6.
- If calls to vacant or illegal numbers are to be routed to the supervisor, System Option 135 (Intercept To Sup.-DID, Dial-In, CCSA, Vacant/Illegal) must be selected. If this option is not selected, calls to vacant or illegal numbers will receive reorder tone.
- If calls to busy numbers are to be routed to the supervisor, System Option 253 (Call Forwarding Busy - System) must be selected.
- If calls to an extension that are not answered within the selected time-out period are to be forwarded to the supervisor, System Option 254 (Call Forwarding - Don't Answer - System) must be selected.
- System Option 131 (DID to Non-CO Trunks via Supervisor Inhibit) must be selected, if DID, CCSA trunks are not to be connected to Non-CO via the supervisor.

- Assign an access code to feature number 20 (Alternate Supervisor Access). This provides an access number to the supervisor for DID, CCSA calls.

Operation

None

Class of Service (COS)

Description

The system allows up to 16 independent COS to be defined. Each COS specifies the features and options that may be accessed by an extension, Dial-In Trunk or DISA Trunk.

Conditions

- A maximum of sixteen independent COS are available.
- One COS may be assigned per extension.
- Several COS options are mutually exclusive. These are listed in Table 2-8b at the beginning of this section.

Programming

- Assign the desired features to each COS.
- Assign the required access codes to Features.
- Assign a COS to each extension, Dial-In Trunk and DISA Trunk.

Operation

None

Common Alerting Devices (Night Bells)

Description

This feature allows incoming and internal calls directed to the supervisor console to appear also at one of three common alerting devices. The call may be answered either from the supervisor console, or from a station with TAFAS Access in its COS. The system provides a contact closure which is used to operate the alerting device. See TAFAS.

Conditions

None

Programming

- Assign 1, 2 or 3 (for common alerting devices 1, 2 or 3 respectively) to Day, Night 1 and Night 2 when programming each Non Dial-In Trunk that is to appear on a common alerting device.
- Assign Option Number 54 (TAFAS Access) to the COS of any extension which is to answer calls appearing on common alerting devices.
- In console-less operation, it is desirable to have a minor alarm ring Night Bell 3. Select System Option 162 (Night Bell 3 with Minor Alarm Enable).

Operation

- In console-less operation, the night bell may be turned off by dialing 555 + 1 from the console or test line, or by pressing the ALARM RESET button on the console.

Console-less Operation

Description

The system may be operated without the use of an supervisor console. Under these conditions all features associated with the console will be unavailable.

Conditions

- All features originated by or directed to the console are not available.
- The system will operate in NIGHT 1 mode.

Programming

- All incoming trunks must have a NIGHT 1 assignment to a night bell, extension or hunt group.

Operation

None

Contact Monitor

Description

This feature allows a station line to be used for monitoring an alarm contact. The contact to be monitored is connected across Tip and Ring of a line. When the contact closes, the call is presented to the supervisor as a Dial 0 call. On answering the call, the SOURCE display on the console shows the extension number assigned to the contact and a COS of AL. An extension may be programmed as a Contact Monitor. If the ACD system is equipped with an optional reserve power supply, there are provisions for an "on battery indicator". This indicator may activate a Contact Monitor to alert the supervisor that the system is on battery power (AC power failure). See MITL9105/9110-090-200-NA, Shipping, Receiving and Installation.

Conditions

- COS Option Number 58 (Contact Monitor), and Option Number 44 (Receive Only) are mutually exclusive.

Programming

- The COS assigned to the line (alarm contact) must include Option Number 58 (Contact Monitor).
- The contact signal is nonlatching; i.e. if the contact opens, the Dial 0 call will disappear from the supervisor console.

Operation

None

Control of Trunk Group Access

Description

Each supervisor console provides a Trunk Group Status display. This display continuously shows the Busy and Supervisor Access status of the first ten trunk groups. The supervisor may restrict a trunk group to Supervisor Access only, or return it to Dial Access. An extension which dials a trunk in a trunk group that has been made Supervisor Access will be intercepted to the supervisor (Illegal Access Intercept to the Supervisor) or reorder tone will be returned.

Conditions

None

Programming

- If calls are to be intercepted to the supervisor during Day Service, select System Option 136 (Intercept to Sup.-Illegal Access).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

To make a trunk group Supervisor Access:

- Dial *6.
- Dial the number of required trunk group (1-10).
- Press the * button.
- Press the RELEASE button - the trunk group may only be accessed by the supervisor.

To make a trunk group Dial Access:

- Dial *6.
- Dial the number of required trunk group (1-10).
- Press the # button.
- Press the RELEASE button - the trunk group is now Dial Access and may be accessed by extensions.

Controlled Outgoing Restriction Setup

Description

If this feature is selected, the supervisor may restrict an extension from making any outgoing trunk calls. The supervisor may also remove the restriction. While the restriction is in force, any outgoing trunk call from the extension is intercepted to the supervisor (Illegal Access Intercept to the Supervisor) or reorder tone. If this option, and System Options 113 (GUEST ROOM Button Enable) and 119 (Supervisor ROOM STATUS Button Enable and Display Enable) are selected, outgoing restriction is automatically set when the room status is set to "1", Room Vacant and ready to be occupied or "3" Room Vacant but not ready.

Conditions

- Night Service 2 is not available.
- Room Status Button and Controlled Outgoing Restriction are mutually exclusive.

Programming

- Select System Option 258 (Controlled Outgoing Restriction Setup Enable).
- Select System Option 113 (GUEST ROOM Button Enable) if Controlled Outgoing Restriction is to be set up without ringing the extensions.
- If the restriction is to be set automatically when the Room Status is set to 1 or 3, select System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable).
- If calls are to be intercepted to the supervisor, select System Option Number 136 (Intercept to Sup.-Illegal Access).

Operation

To set Controlled Outgoing Restriction:

- Press the GUEST ROOM button.
- Dial the required extension number.
- Press the ROOM RESTR button - the ROOM RESTR lamp lights, Controlled Outgoing Restriction is now in effect on the extension.
- Press the RELEASE button.

To remove Controlled Outgoing Restriction:

- Press the GUEST ROOM button.
- Dial the required extension number - the ROOM RESTR lamp lights.

- Press the ROOM RESTR button – the ROOM RESTR lamp goes out, outgoing restriction is removed from the extension.
- Room restriction may also be turned on or off while the supervisor is talking to a room by pressing the ROOM RESTR button.

For automatic restriction operation, refer to the ROOM STATUS feature description.

Controlled Station Restriction (Do Not Disturb)

Description

The Do Not Disturb feature allows a user to have all incoming calls to the extension, routed to the supervisor or reorder tone. The feature may be activated by the extension user or by the supervisor. If the supervisor calls an extension with Do Not Disturb active, the console DO NOT DSTB lamp flashes and the ERR lamp lights in the DESTINATION display. The supervisor may override the feature by pressing the DO NOT DSTB button. All other calls directed to the extension receive reorder tone or are intercepted to the supervisor. Other features (e.g. Hunting, Call Forwarding) work as if the extension were busy. Call origination from an extension with this feature active is not affected in any way.

Conditions

- A busy lamp must be assigned to an extension in order for it to be included in the displayed total count of Do Not Disturb's.
- System Option 187 (Do Not Disturb Enable) must be enabled, otherwise the DO NOT DSTB button will be inoperative.
- If Do Not Disturb is to be toggled in the Room Mode, System Option 113 (GUEST ROOM Button Enable) must be selected.
- If the supervisor dials an extension with Do Not Disturb in effect, and has a source, the console must be in Both or Destination Mode to override Do Not Disturb.

Programming

- Select System Option 187 (Do Not Disturb Enable).
- Select System Option 113 (GUEST ROOM Button Enable) if Do Not Disturb is to be set without ringing the extension.
- Select System Option 138 (Intercept to Att-Do not Disturb) if calls are to be intercepted to the supervisor. If this option is not selected, calls to a Do Not Disturb extension will receive reorder tone.
- If the Do Not Disturb status of the extensions are to be displayed, Select System Option 112 (Supervisor Do Not Disturb and Message Waiting Display Enable).
- If the extension is to be able to set up and cancel Do Not Disturb, its COS must contain Option Number 78.
- If COS Option Number 78 (Room Do Not Disturb Setup Enable) is enabled, an access code must be assigned to Feature Number 24 (Do Not Disturb Setup and Cancel).

Operation

To set Do Not Disturb from the extension:

- Dial the Do Not Disturb access code followed by the digit 1 - dial tone is heard.
- Replace the extension handset - all calls to the extension will be intercepted.

To remove Do Not Disturb from the extension:

- Dial the Do Not Disturb access code followed by the digit 2 – dial tone is returned.
- Replace the extension handset – calls may be received by the extension in the normal manner.

To set up Do Not Disturb when calling the extension from the console:

- Dial the required extension number – ringing tone or busy tone is returned.
- Press the DO NOT DSTB button – the DO NOT DSTB LED lights.
- Press the RELEASE button – all calls to the extension are intercepted.

To override Do Not Disturb when calling the extension from the console:

- Dial the required extension number – the ERR lamp lights and the DO NOT DSTB LED flashes.
- Press the DO NOT DSTB button – extension rings or busy tone is returned if the extension is in use. The DO NOT DSTB LED lights.
- At this point, supervisor call handling proceeds as normal.

To set up Do Not Disturb without calling the extension:

- Press the GUEST ROOM button.
- Dial the required extension number.
- Press the DO NOT DSTB button – the DO NOT DSTB LED lights, all calls to the extension are intercepted.

To remove Do Not Disturb without calling the extension:

- Press the GUEST ROOM button.
- Dial the required extension number.
- Press the DO NOT DSTB button – the DO NOT DSTB LED is extinguished – calls may be received by the extension in the normal manner.

To display the total number of Do Not Disturb's set:

- Press the DO NOT DSTB button – the busy lamp field changes to show only those extensions with Do Not Disturb set and the SOURCE display shows the total number of the Do Not Disturb's set.

CO Trunk Via Supervisor Inhibit

Description

This feature denies an extension the ability to be connected to a CO trunk through the supervisor. This restriction applies to both incoming and outgoing calls.

Conditions

None

Programming

- The COS of the extension must contain Option Number 60 (CO Trunk via Supervisor Inhibit).

Operation

None

Customer-Controlled Programming

Description

The customer may perform limited programming of the ACD system by dialing the Limited Programming Security Code. This programming is possible only if the relevant System Options have been set at the time of installation (or on a subsequent occasion).

Conditions

- An attempt to enter a mode for which the facility is not set (see Programming) will result in an "E0" message.
- The normal Programming Security Code (Feature Number 29) cannot be changed or displayed by the customer. If access is attempted while in pr0gramming, an "E0" message will be given. An attempt to display the assigned number by using the NEXT key will result in a skip from Feature Number 28 to Number 30.
- If customer System Option Programming is allowed (see Programming), the customer cannot modify or access any of the installer-programmed Options 260 through 272. An "E0" message will be given if an attempt is made to access these.
- The customer may change but not delete the customer programming access code.

Programming

- The thumbwheel switches on the Tone Control Card do not have to be set to 777X (usual programming setting).
- One or more of the following System Options must be set if the relevant feature is to be programmed by the customer:
  - 261 Customer Programming of ARS Enable
  - 262 Customer Programming of COS Definitions Enable
  - 263 Customer Programming of Extensions Enable
  - 264 Customer Programming of Features Enable
  - 265 Customer Programming of Hunt Groups Enable
  - 266 Customer Programming of Speed Call Enable
  - 267 Customer Programming of System Options Enable
  - 268 Customer Programming of Toll Control Enable
  - 269 Customer Programming of Trunk Groups Enable
  - 270 Customer Programming of Trunks Enable
  - 271 Customer Range Programming Enable
  - 272 Customer Programming of SUPERSET 4 Enable.
- System Option 260 (Customer Programming Enable) must be set if one or more of the above System Options are to be set.
- Feature Number 43 (Customer Programming Security Code) must be assigned a 1- to 4-digit number. This number must not conflict with the existing numbering plan.

Operation

To enter Customer Programming Mode:

- Dial the Limited Programming Security Code. The programming mode is entered.
- Perform standard programming as required.
- If extended programming is required, press the NEXT button. If not required, proceed to last step below.
- Perform extended programming as required.
- To exit from the Extended Programming Mode, press the NEXT button.
- To exit from the Standard Programming Mode, press the LAMP TEST button.

Customer Data Dump/Load

Description

This feature allows the contents of the Non-Volatile RAM (the customer data) to be dumped on a storage device. Any RS232 compatible recording device may be used. This data may be used to reprogram a system or program an alternate system (with the same customer data).

Conditions

The system can accommodate any of the following characteristics:

- RS232C interface.
- ASCII characters variable selection (5-8 data bits, 1, 1.5 or 2 stop bits).
- Parity enable with choice of odd or even transmission.
- Baud rate transmission: 300 or 1200 baud.
- System Options 313 (Printer Carriage Return Delay) and 314 (Printer Transmit Additional Nulls) should be disabled for any dump.

Dump:

- If the RS232 port is in use when a Dump is requested, the request will be ignored and busy tone returned.
- The Dump function can be performed in 36 minutes at 300 baud or 9 minutes at 1200 baud.

Load:

- During a Data Load the system operates in the Power Failure Transfer mode.
- The load function takes 36 minutes at 300 baud, or 9 minutes at 1200 baud.
- If the first data block is not in the correct format or if a checksum error is detected and the load is terminated.

Programming

- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.
- If the system is to be remotely reset, select System Option 166 (Remote System Reset Protection Override).
- Select System Option 118 (Supervisor Printer Control Enable) to control the printer from the console.
- Select System Option 311 (Ignore Print Enable).

Operation

Dump:

(1)If a tape is used, ensure that it is of the correct length as outlined in the Conditions part of the page, and start the tape at the beginning.

(2)Disconnect the device currently connected to the system RS232 port and connect the recording device to the RS232 port. Place the recording device in the recording mode.

(3)Dial 555 + 7.

(4)Dial the appropriate data block number (from the Table 10), each block separated by an * and another * to signify the end of the entry, or dial * to dump all the RAM data.

(5)Dial *14#.

(6)Press the ENTER button on the console to start the dump. For the duration of the dump, LED 3 on the IPC will be glowing.

(7)When the dump is over, as indicated by LED 3 on the IPC extinguishing stop the output at the port by dialing *14* at the console device to the port. Restart the port by dialing *14# from the console and pressing the ENTER button.

TABLE 10
CUSTOMER DATA BLOCKS

Data Block Number	Customer Data Block Information
1	All Standard Programming and Superset Customer Data
3	ARS
5	Station Information (extension meters, room status, etc.)
6	Alarm Call
7	System Speed Call
8	Superset Speed Call

Loading Data Block 1:

(1)When loading the system, Data Block 1 (Table 10) must be present or be loaded first.

(2)To load Data Block 1, set the thumbwheel switches on the Tone Control card to 5623.

(3)Disconnect the device currently connected to the RS232 port.

(4)Connect the recording device to the RS232 port.

(5)Set the recording device to read.

(6)Press the autoload button on the IPC. When the autoload button is pressed the system will be reset, all calls will be lost and the system will be in automatic transfer for the duration of the dump. During the loading process the LEDs on the Scanner will read 01 to RR, where RR is the final block to loaded (note that RR can not be calculated as it is a reflection of RAM data to be loaded).

(7)When the system has been loaded, LED 3 on the IPC will extinguish and the system will reset. Disconnect the recording device and reconnect the former device. At this time other Data Blocks may be entered or normal switch activity started.

Specific Data Block Load:

(1)When loading the system, Data Block 1 (Table 10) must be present or be loaded first.

(2)To load a specific Data Block, set the thumbwheel switches on the Tone Control card to 3282.

(3)Disconnect the device currently connected to the RS232 port.

(4)Connect the recording device to the RS232 port.

(5)Set the recording device to read.

(6)From the console dial 555 + 72 + the first Data Block number (Table 10). If other Data blocks are to be loaded, dial # plus the next Data Block number followed by # for each Data Block. Use a double # to signify the last Data Block entry (i.e. 555+72+2+#+3+#, would load data blocks 2 and 3).

(7)Press the ENTER button on the console and the system will reset, all calls will be lost and the system will be in automatic transfer for the duration of the dump. During athe loading process the LEDs of the Scanner will read 01 to RR, where RR is the final block to be loaded (note that RR can not be calculated as it is a reflection of RAM data to be loaded).

(8)When the system has been loaded, LED 3 on the IPC will extinguish and the system will reset. Disconnect the recording device and reconnect the former device. At this time other Data Blocks may be entered or normal switch

activity started.

To load all Data Blocks:

(1) When loading the system, Data Block 1 (Table 10) must be present or be loaded first.

(2) Set the thumbwheel switches on the Tone Control card to 5623.

(3) Disconnect the device currently connected to the RS232 port.

(4) Connect the recording device to the RS232 port.

(5) Set the recording device to read.

(6) Dial 555 + # – dial tone is returned.

(7) Press the ENTER button.

(8) Press the autoload button on the IPC. When the autoload button is pressed the system will reset, all calls will be loaded and the system will be in automatic transfer for the duration of the dump. During the loading process the LEDs on the Scanner will read 01 to RR, where RR is the final block to be loaded (note that RR can not be calculated as it is a reflection of RAM data to be loaded).

(9) When the system has been loaded, LED 3 on the IPC will extinguish and the system will reset. Disconnect the recording device and reconnect the former device. At this time normal switch activity will start.

Errors

2.04 During the loading of the system certain errors may be displayed on the Scanner card LEDs. For a complete outline of the errors see Table 11.

TABLE 11
LOAD ERRORS

Display	Meaning
A#	Number of records written inconsistent with the number on the tape.
B#	Checksum line does not verify.
C#	Checksum line does not verify. If the display is CO, it is a label error. If the error is a C + a number, it is a Data Block error.
D#	Data block found but not on label.
EO	Data block requested not on tape.
FO	Load attempted but no Data Block numbers entered.

Customer Data Print

Description

Customer Data Print provides a means of displaying the current state of programming of the switch. The data is displayed in a format similar to that in which it was recorded on the programming forms. The printout is made under 21 headings, grouped into six sections, as follows: Section 1, System Option Features (Access Codes), Classes of Service, Hunt Groups, Extensions; Section 2, Non-Dial-In Trunks, Dial-In Trunks, DID/CCSA Dial-In Trunks, Trunk Groups; Section 3, Special Sets, Special Set Messages; Section 4, Personal Speed Call Tables, System-Wide Speed Call Tables; Section 5, Absorb Plans, Classes of Restriction, Control Plans, Restriction Tables; Section 6, ARS Configuration, Data Office Code Tables, Modify Digits Tables, Route Tables. The data print operation may be invoked from either the supervisor console or through use of the maintenance code. Accessibility of the data is dependent upon the source of the print instruction.

Conditions

- The "Print System-Wide Data" instruction (see 'Operation') may be used only from the Supervisor Console. If the Supervisor Console is used to initiate the print process, data will only be printed if the relevant customer programming option is enabled. For example, ARS data will only be printed if the relevant customer programming option (in this case option 261, Customer Programming of ARS Enable) has been activated. The print program will skip over those blocks of data which are restricted and print only those which are allowed. The only exception to the above is the "Print System-Wide" instruction, which results in an unrestricted output of the relevant data. If a Customer Data Print is in effect, any other operation requiring the printer (e.g., SMDR, Traffic Measurement) will be printed after the Data Print is complete.

The printer must have the following characterisitcs:

- A line of 80 characters, a carriage return, a line feed and optional null characters.

The system can accommodate any of the following characteristics:

- RS232 interface.
- ASCII characters variable selection (5-8 data bits, 1, 1.5 or 2 stop bits).
- Parity enable with choice of odd or even transmission.
- Baud rate transmission of 300 or 1200 baud.

Programming

- Select System Option 259 (Customer Data Print Enable).
- Assign an access code to Feature Number 18 (Supervisor Function), usually *.

- Select System Option 118 (Supervisor Printer Control Enable) to control the printer from the console.

Operation

To request a Customer-Accessible Data Print from the console:

- Dial ⁎,1,9, followed by a digit in the range 0-6 to select the type of printout required.
- Press RELEASE button - printout of all data that the customer may change starts.

To request a print of all Speed Call Data from the console:

- Dial ⁎19⁎.
- Press RELEASE button - printout of all Speed Call Data starts.

To request a print of all customer RAM data from the test line or console:

- Dial 555 + 9.
- Press RELEASE button on the console - printout of all customer RAM data is printed.
- LED 3 on the IPC card will be lit for the duration of the printout.

Data Demultiplexer

Description

The Data Demultiplexer allows a different recording device to be used for: Traffic Measurement, SMDR, Hotel/Motel and Maintenance.

Conditions

- The Scanner card and the Data Demultiplexer card must have the same switch settings for: Baud rate, character length, parity and stop bit selection.

Programming

- Select System Option 151 (Data Demultiplex Enable).
- Ensure the Printer is set for the same Baud rates, character length, parity and stop bit selection as the Scanner Card and Data Demultiplexer.

Operation

See Automatic Wake-Up, Customer Data Print, Customer Data Dump Load, Station Message Detail Recording and Section MITL9160-080-300-NA.

Data Security

Description

Any call which includes an extension with a COS containing Data Security cannot be overridden or receive Camp-On tone. The extension may be Camped-On to, but is secure against any form of audio intrusion.

Conditions

None

Programming

- Include in the COS of the extension, Option Number 41 (Data Security).

Operation

None

Diagnostics

Description

The system continuously runs diagnostic checks on the system operation, and if a malfunction is detected, raises an alarm. Refer to MITL9105/9110-090-500-NA, General Maintenance Information for a full description of diagnostics.

Conditions

None

Programming

None

Operation

None

Dial Access to the Supervisor

Description

An extension may access the supervisor by dialing a code (Feature Number 1). This code will generally be the numeral 0.

Conditions

- The Supervisor access code may not conflict with any other access code.

Programming

- Assign an access code to Feature Number 1 (Supervisor Access).

Operation

- Dial Supervisor access code.
  - Ringback tone returned.
  - Supervisor console rung.

Dial Call Pickup

Description

This feature allows an extension to be assigned to a Pickup group and to answer any call to that group, by dialing the Dial Call Pickup code.

Conditions

- Dial Call Pickup cannot be originated by an extension with a call on consultation hold. If Dial Call Pickup is attempted, the originating extension receives reorder tone and must flash to return to the held call.
- A maximum of 30 Pickup groups are permitted per system.

Programming

- An access code must be assigned to Feature Number 7 (Dial Call Pickup). This code cannot conflict with the system numbering plan.
- Assign the extension to the required Pickup Group.

Operation

- Lift the handset – dial tone is returned.
- Dial the Call Pickup code – the call is connected.

Dial Pulse Signaling

Description

The ACD system may accept or generate dial pulses. The system's Central Processor Unit (CPU) reads dialed digits (decoded by the Receiver card) and validates and/or causes the necessary operation. The CPU may also cause the trunk card accessed by an extension to outpulse digits.

Conditions

None

Programming

None

Operation

None

Dialed Activity Reporting Terminal (DART)

Description

The DART is a telephone management device which allows the user to record accurately the costs of incoming and outgoing calls by costing all calls and appending them to a call summary recorded in the terminal. The terminal accepts input from Station Message Detail Recording (SMDR) output of the ACD system, and provides general or detailed summaries of calling data on demand. An associated printer accepts the output of the terminal and prints the data in fixed format. This data can relate to individual telephone extensions, all extensions in stipulated areas or the total number of extensions in the users establishment, as well as to the attendant console.

The summaries are cost-related to Direct Distance Dialing (DDD), International Direct Distance Dialing (IDDD), Inwats, Outwats, Foreign Exchange (FX), Tie Trunks or value added carriers such as SPRINT or MCI. The terminal analysis dialed digits and assigns cost based on destination, facility used, the duration of the call, time of day and day of the week.

All costings are calculated from information contained in various databases programmed into the DART (TRADEMARK) from DART central. Refer to Section MITL9162-953-002-NA, Dialed Activity Reporting Terminal (DART).

Conditions

- COS Option 41 (Data Security) must be enabled.
- Account Codes are limited to a maximum of 10 digits.
- Data rates must be matched for adequate communication.

Programming

The required SMDR features must be programmed. Refer to Section MITL9105/9110-090-451-NA, Station Message Detail Recording.

Operation

Refer to Section MITL9162-953-002-NA, Dialed Activity Reporting Terminal (DART).

DID/Dial-In CCSA Vacant/Illegal Access Intercept to Recorded Announcement

Description

DID, CCSA or Dial In calls to vacant or unauthorized levels or numbers can be routed to Recorded Announcements. If system Option 135 (Intercept to Supervisor DID, Dial-In, CCSA, Vacant, Illegal) is enabled the call will (after hearing the recording) be transferred to the supervisor. If Option 135 is not enabled the caller will then receive reorder tone.

Conditions

None

Programming

- To define the recording group the calls will go to:
- From the console, dial *233
- Dial the Recording Group Access Code.

To delete an existing intercept to a Recording Group:

- From the console; dial *233
- Dial #

Operation

None

DID/Dial-In/CCSA Vacant/Illegal Access Intercept to Supervisor

Description

Selection of this System Option causes all DID, CCSA or Dial-In Tie Trunk calls to vacant or unauthorized levels or numbers to be routed to the supervisor. If this option is not selected, these calls receive reorder tone.

Conditions

- If an intercept to a Recorded Announcement has been programmed (see DID/Dial-In/CCSA Vacant/Illegal Access Intercept to Recorded Announcement) the call will first be forwarded to the Recorded Announcement and then to the supervisor.

Programming

- Select System Option 135 (Intercept to Sup.-DID, Dial-In, CCSA, Vacant/Illegal).

Operation

None

DID to Non-CO Trunks via Supervisor Inhibit

Description

Selection of this System Option prevents the supervisor from routing incoming DID trunk calls to non-CO outgoing trunks.

Conditions

None

Programming

- Select System Option 133 (DID to Non-CO Trunks via Supervisor Inhibit).

Operation

None

Digit Translation

Description

The ACD system may be programmed to provide one of three Digit Translation Plans.

Digit Translation Plan 1 provides the following translations:

- The digit 1 produces 2 pulses.
- The digit 2 produces 3 pulses.
- The digit 3 produces 4 pulses.
- The digit 4 produces 5 pulses.
- The digit 5 produces 6 pulses.
- The digit 6 produces 7 pulses.
- The digit 7 produces 8 pulses.
- The digit 8 produces 9 pulses.
- The digit 9 produces 10 pulses.
- The digit 0 produces 1 pulse.

Digit Translation Plan 2 provides the following translations:

- The digit 1 produces 9 pulses.
- The digit 2 produces 8 pulses.
- The digit 3 produces 7 pulses.
- The digit 4 produces 6 pulses.
- The digit 5 produces 5 pulses.
- The digit 6 produces 4 pulses.
- The digit 7 produces 3 pulses.
- The digit 8 produces 2 pulses.
- The digit 9 produces 1 pulse.
- The digit 0 produces 10 pulses.

Digit Translation Plan 3 provides the following translations:

- The digit 1 produces 10 pulses.
- The digit 2 produces 9 pulses.
- The digit 3 produces 8 pulses.
- The digit 4 produces 7 pulses.
- The digit 5 produces 6 pulses.
- The digit 6 produces 5 pulses.
- The digit 7 produces 4 pulses.
- The digit 8 produces 3 pulses.
- The digit 9 produces 2 pulses.
- The digit 0 produces 1 pulse.

Conditions

Only one translation plan may be in effect at a time.

Programming

- Select System Option 153 (Digit Translation Plan 1) to enable Digit Translation Plan 1.

- Select System Option 154 (Digit Translation Plan 2) to enable Digit Translation Plan 2.
- Select System Option 155 (Digit Translation Plan 3) to enable Digit Translation Plan 3.

Operation

None

Direct-In Lines

Description

This feature allows incoming trunks to be assigned to a specific extension or hunt group. Incoming calls from the trunk ring the extension (or hunt group) directly. The calls do not appear at the supervisor console. If the assigned extension is busy when a call arrives, the call will be camped-on. If all extensions of a Hunt Group are busy, the call will be queued. In no case will the call be answered, therefore the caller will hear ringback tone from the CO. Camp-On tone will be heard by an extension which is camped-onto. If a Hunt Group is camped-onto, no tone is heard. All Call Forwarding features may be activated on incoming trunk calls to extensions.

Conditions

- Camp-On Recall and Don't Answer Recall to the supervisor are not active on Direct-In Line calls.
- During Night Service, incoming calls will be directed to the night assignment of the trunk.
- If a Direct-In Line call is handled by the supervisor as the result of a transfer, it will then recall to the supervisor in Day or Night Service.

Programming

- Specify the Day, Night 1 or Night 2 assignments of the trunk as the equipment number of the extension or the hunt group number to which the trunk is to be assigned.
- The trunk type must be Type 1 (Standard Bothway CO Trunk), or 5 (Non Dial-In Tie Trunks).

Operation

None

Direct Inward Dial (DID) Trunks

Description

This feature allows DID trunks to be used in the system. The length of the incoming number, the number of digits to be absorbed, and a prefix digit, if required, may also be specified.

Conditions

- If the DID trunk sends less digits than expected, the trunk will receive reorder tone from the ACD system after the interdigit time-out (15 s).
- DID trunks may access extensions, hunt groups or the supervisor, but not hands-free stations.
- An extension with Option Number 43 (Inward Restriction DID) in its COS cannot receive a call directly from a DID trunk.
- DID trunks can be used outgoing, only if special network equipment is provided (see CCSA).
- DID trunks are rotary dial only, never DTMF. Incoming trunk calls to the supervisor always appear on LDN 4.

Programming

- When programming the trunk, the entry made after pressing the I/C (Incoming Digits) button may consist of two or three digits.
  - First Digit - specifies the number of incoming digits (1-9).
  - Second Digit - specifies the number of leading digits to be absorbed (0-8).
  - Third Digit, if required - the actual digit to be prefixed to the incoming number after absorption (0-9). The maximum number of digits permitted after absorption and after adding the prefix digit is four.
- The trunk type must be specified as 3.
- If calls to vacant or illegal numbers are to be routed to the supervisor, System Option 135 (Intercept To SUP.-DID, Dial-In, CCSA, Vacant/Illegal or Dial-In Vacant/Illegal Access to the Supervisor) must be selected. If this option is not selected, calls to vacant or illegal numbers will receive reorder tone.
- If calls to busy numbers are to be routed to the supervisor, System Option 253 (Call Forwarding Busy - System) must be selected.
- If calls to an extension that are not answered within the selected time-out period are to be forwarded to the supervisor, System Option 254 (Call Forwarding - Don't Answer - System) must be selected.
- If DID trunks are not to be connected to Non-CO trunks via the supervisor, System Option 133 (DID to Non-CO Trunks via Supervisor Inhibit) must be selected.
- Assign an access code to Feature Number 20 (Alternate Supervisor Access Code). This provides an access number to the supervisor for DID calls.

Operation

None

Direct Inward System Access (DISA)

Description

This feature allows an external caller to access the ACD system by selecting a special trunk and dialing a security code. After the code is dialed, the System returns dial tone to the caller, who may then access any features in the DISA trunk's COS except for those which require a switchhook flash. See also Verifiable Account Codes.

Conditions

- The outside caller must use a DTMF telephone.
- The security code may be 1, 2, 3 or 4 digits in length.
- The same security code applies to all DISA calls.
- If a caller dials an invalid code, the call is dropped after three digits have been dialed. Reorder tone is not returned to the caller.
- A DISA trunk may be used as a standard CO trunk.
- Access to the allowed features is controlled by the COS assigned to the trunk.
- Switchhook flash is not possible on a DISA trunk.

Programming

- Program trunk(s) as type 2 (DISA).
- Assign a DISA security access code to Feature Number 21 (Direct Inward System Access).
- If the supervisor is allowed to change the DISA access code, select System Option 111 (Supervisor DISA Code Setup Enable).
- Assign a COS to the trunk.

Operation

To access the System:

- Dial the required directory number from a DTMF telephone.
- The System returns two bursts of ringback tone followed by dial tone.
- Dial the DISA security code – ACD dial tone returned.
- Dial the required feature access code or extension.

Direct Outward Dialing

Description

The Direct Outward Dialing feature allows an extension user to make external calls without the assistance of the supervisor.

Conditions

- Access restrictions to the trunks are controlled by Class-of-Service Option Numbers 65 through 76 (Trunk Group Access).
- Some Direct Outward Dialing may be restricted by Multi-Digit Toll Control (see Section MITL9105/9110-090-212-NA).

Programming

- Program the required Class of Service to include the required trunk group access.
- Assign the Class of Service to the required extension.
- Program the trunk.
- Program the trunk group.
- Assign an access code to the trunk group.

Operation

- Lift the handset, dial the access code – CO dial tone is returned.
- Dial the required external number.

Direct to ARS

Description

This COS Option if selected enables the extension or DISA trunk to be directly routed to ARS without dialing the CO trunk Access Code (usually 9). This option when used with extensions is also called Outgoing Concentrator.

Conditions

This COS Option does not apply to test lines or SUPERSETS.

Programming

Select COS Option 111 (Direct to ARS).

Operation

None

Direct Trunk Access

Description

The console or test line may directly access a trunk for maintenance or operational procedures.

Conditions

None

Programming

- Assign an access code to Feature Number 19 (Maintenance Function).
- Assign an access code to Feature Number 18 (Supervisor Function).

Operation

(Where 555 is the Maintenance Function code).

- From the console, dial 555 + 2 + the equipment number, or dial ⁎, 20 + equipment number + ⁎ (or #).
- From the test line dial 555 + 2 + the equipment number.

Direct Trunk Select (DTS)

Description

This feature enables a line to access a trunk directly. This line can be used for incoming and outgoing calls and can appear on several SUPERSETs or be transferred to both SUPERSETs and regular sets.

Conditions

The trunk must have both trunk and trunk group programming completed to assign it to a SUPERSET.

If this feature is added to an existing trunk group, it cannot be accessed by that trunk group's Access Code.

Programming

See SUPERSET programming forms.

Operation

- Lift handset.
- Select appropriate (DTS) line key – Dial tone returned.

Directed Call Pickup

Description

Directed Call Pickup allows an extension user to answer any ringing telephone within the ACD system. If more than one party attempts to pick up the call, the call will be completed to the first party; other parties will receive busy tone.

Conditions

- Directed Call Pickup cannot be originated by an extension after flashing. If Directed Call Pickup is attempted, the originating extension receives reorder tone and must flash to return to the held call.

Programming

- The COS of the extension must include Option Number 39 (Directed Call Pickup).
- An access code must be assigned to Feature Number 8 (Directed Call Pickup).

Operation

- Lift the handset – dial tone is returned.
- Dial the Directed Call Pickup code followed by the number of the ringing extension – the call is completed.

Discriminating Dial Tone

Description

An extension having Do Not Disturb or a Call Forwarding – Follow Me in effect, will hear a distinct dial tone (350/440 Hz, 400 ms on, 100 ms off for 6 cycles, then continuous tone) when going off-hook.

Conditions

None

Programming

- Select System Option 185 (Discriminating Dial Tone).

Operation

If any extension goes off-hook while having Do Not Disturb or Call Forwarding – Follow Me in effect, discriminating dial tone will be returned.

Discriminating Ringing – All Calls

Description

If this system Option is selected, all internal and external calls will have the discriminating ringing pattern (0.5 seconds ON, 0.5 seconds OFF, 0.5 seconds ON, 2 seconds OFF).

Conditions

None

Programming

- Select System Option 207 (Discriminating Ringing – All Calls).

Operation

None

Do Not Disturb

Description

A supervisor or extension may set up or cancel Do Not Disturb for an extension.

Conditions

- Automatic Wake-Up will override Do Not Disturb.
- For an extension to be included in the total number of Do Not Disturbs set (see Do Not Disturb Display), that extension must be assigned to a busy lamp.
- For the supervisor to set up Do Not Disturb for an extension, the GUEST ROOM button must be enabled (see GUEST ROOM Button).
- Executive Busy Override is not effective on Do Not Disturb.

Programming

- Select System Option 187 (Do Not Disturb Enable).
- The extension's Class of Service must include Option Number 78 (Room Do Not Disturb Enable).
- To intercept to the supervisor, a call to an extension with Do Not Disturb in effect, select System Option 138 (Intercept to Sup.-Do Not Disturb)
- To display all extension's with Do Not Disturb, select System Option 112 (Supervisor Do Not Disturb and Message Waiting Display).
- Assign a Feature code to Feature Number 24 (Room Do Not Disturb).
- Select System Option 187 (Do Not Disturb Enable).

Operation

To set up Do Not Disturb from the console:

- Press GUEST ROOM button.
  Dial the extension number - SOURCE display shows extension number and Message Register, DESTINATION display shows Room Status.
- Press DO NOT DSTB button - extension busy lamp lights for the duration of Do Not Disturb.
- Press RELEASE button - Do Not Disturb in effect.

To cancel Do Not Disturb from the console:

- Press GUEST ROOM button.
- Dial the extension number - SOURCE display shows extension number and Message Register, DESTINATION display shows Room Status.

- Press DO NOT DSTB button – extension busy lamp goes out.
- Press RELEASE button – Do Not Disturb cancelled.

To override Do Not Disturb from the console:

- Dial extension number – DO NOT DSTB LED flashes, extension busy lamp lit, DESTINATION display shows extension number and Class of Service, ATT lamp lit and ERR lamp lit.
- Press DO NOT DSTB button – extension rings normally (Do Not Disturb is not cancelled).

To set up Do Not Disturb from an extension:

- Lift handset.
- Dial Do Not Disturb code + 1 – dial tone is returned.
- Return handset – Do Not Disturb in effect.

To cancel Do Not Disturb from an extension:

- Lift handset.
- Dial Do Not Disturb code + 2 – dial tone is returned.
- Return handset – Do Not Disturb is cancelled.

Do Not Disturb Display

Description

This feature allows the supervisor to display all extensions that have Do Not Disturb set. When the supervisor presses and holds the DO NOT DSTB button (while the console is idle), the busy lamp field goes dark, leaving only the lamps lit for the rooms that have Do Not Disturb active. In addition, the SOURCE display shows the total number of extensions with a Busy Lamp assigned and Do Not Disturb set.

Conditions

- The console must be idle. If the console has an extension as its SOURCE or DESTINATION party, or if the supervisor is using the GUEST ROOM button, the Do Not Disturb status for that extension will be changed.
- For an extension to be included in the SOURCE display, the extension must have a busy lamp assigned to it.

Programming

- Select System Option 187 (Do Not Disturb Enable).
- Select System Option 112 (Supervisor Do Not Disturb and Message Waiting Display Enable).

Operation

- Press the DO NOT DSTB button – the busy lamp field changes to display only the extensions that have Do Not Disturb active; the SOURCE display shows the total number of extensions that have Do Not Disturb set.
- Release the DO NOT DSTB button – the busy lamp field returns to normal.

Do Not Overflow (Trunks)

Description

If an extension has Do Not Overflow in its COS and dials a busy trunk group, busy tone is returned by the system and trunk group overflow is denied (see Trunk Groups).

Conditions

None

Programming

- Assign Option Number 52 (Do Not Overflow) to the extension's COS.
- Assign COS to required extensions.

Operation

None

DTMF to Rotary Dial Conversion (Tone-to-Pulse Conversion)

Description

This feature automatically converts DTMF tones from DTMF equipment to rotary dial outpulsing on outgoing trunks which have been programmed as rotary dial trunks. The convertor can accommodate a string of up to 26 digits.

Conditions

- The DTMF digits also appear on the trunk, as early line split is not provided, except in the case of E&M or loop tie trunks, where trunk group type contains a 4 as the first digit. In this case, no audio will be transmitted to the trunk, and answer supervision MUST be returned in order to restore outgoing audio.

Programming

- The third digit of the 4-digit Trunk Group Type must be a 1 or a 2.

Operation

None

Earth Ground Button

Description

As an alternative to switchhook flash, users may wish to use an Earth Ground Button. This alternative may be invoked by selecting the 'Earth Ground Button' Class-of-Service Option.

Conditions

All telephone sets using this option must be equipped with an earth ground button.

Programming

Select Class-of-Service Option 101 (Earth Ground Button).

Operation

On sets using this option, wherever the operation calls for switchhook flash, the earth ground button is pressed.

Enable Non-CO Trunk- Trunk Connect by Extension

Description

This feature enables an extension to connect a Non-CO trunk to a CO or Non-CO trunk, then go on-hook and leave the two trunks connected.

Conditions

- One trunk must be a Non-CO trunk.
- If the COS of an extension contains Option Number 62 (Flash for a Supervisor), a switchhook flash will present the call to the supervisor.
- Option 46 (Flash Disable) and System Option 188 (Extension Non-CO Trunk - Trunk Connect Enable) are mutually exclusive.

Programming

- Select System Option 188 (Extension Non-CO Trunk - Trunk Connect Enable).
- Select System Option 181 (Can Flash if on an Incoming Trunk).
- Select System Option 182 (Can Flash if on an Outgoing Trunk).

Operation

- Conversation between trunk and extension.
- The extension flashes switchhook - dial tone returned.
- The extension dials a trunk - the trunk answers.
- The extension hangs up. The trunk and Non-CO trunk are connected.

End of Dial Signal on Outgoing Trunks

Description

This option, if selected, allows the supervisor or extension to access a trunk, dial the required directory number, then complete the call to an internal extension without delay, by pressing the # button to stop digits being passed to the trunk. Digits dialed after the # will be interpreted by the ACD system as a new number (i.e. an extension).

Conditions

- When this option is not included, digits dialed by the supervisor will be passed to the trunk until one of the following occurs: answer supervision is received, a 10 second interdigit pause in dialing occurs, or the supervisor puts the trunk on hold.
- This option is only available to DTMF extensions.

Programming

- Select System Option 134 (End of Dial Signal for Outgoing Trunks).

Operation

From the console:

- Dial the required trunk group access code.
- Dial the required external directory number – ringing tone is returned.
- Press the # button.
- Dial the required extension number or trunk.
- Press the RELEASE button – the called extension is connected to the outside directory number.

From an extension:

- Dial the required trunk group access code.
- Dial the required external directory number.
- Dial #.
- Dial the required extension number or trunk number.

Executive Busy Override (Extensions)

Description

This feature allows a user who encounters a busy extension to dial a code and enter the conversation. Eight hundred milliseconds before override voice contact is established, both parties in the original conversation receive a warning tone (440 Hz). The tone continues for 200 ms after override is established. A 200 ms burst of the 440 Hz tone is repeated every 6 s for the duration of the override. If the overridden extension flashes the switchhook or goes on-hook, the overriding extension is dropped and receives reorder tone.

Conditions

- The overriding extension cannot manipulate the original connection in any way.
- A call in which any extension has a COS that includes Option Number 42 (Station Override Security) or Option Number 41 (Data Security) cannot be overridden.
- Any extension speaking to the supervisor, dialing, or receiving supervisory tone cannot be overridden.
- An extension on hold cannot be overridden.
- An extension with a parked or held call cannot be overridden.

Programming

- The overriding extension must contain Option Number 40 (Executive Busy Override) in its COS.
- Assign a single digit access code to Feature Number 22 (Executive Busy Override).

Operation

- Dial the extension number – busy tone.
- Dial the Executive Busy Override access code – after the warning tone you are connected to the call.

Extension Reset

Description

This COS Option if selected enables an extension to remove any call forwarding, do not disturb and callbacks that may have been set up for that user.

Conditions

None

Programming

Select COS Option 103 (Extension Call Forwarding Reset).

- Assign an Access Code to feature number 47 (Extension Reset).

Operation

To cancel all call forwardings, callbacks and do not disturb:

- Lift the handset – dial tone is returned.
- Dial the Extension Reset feature Access Code – no tone is returned.
- Replace the handset.

External Call Forwarding (ECF)

Description

This feature allows an extension user to set up call forwarding to a number external to the ACD system. This is accomplished by storing the external number as a speed call entry, and using the entry as the number to which the caller is forwarded.

Conditions

- The extension must have one of the call forward options enabled, and also have access to one or more speed call tables in its Class of Service.
- An extension with COS Option 83 (Forced Account Entry Code) in its Class of Service cannot set up the External Call Forwarding feature.
- Toll Control applies to the forwarding party's extension when digits are being sent, if a personal speed call table is used.
- The caller and the forwarder Class of Service options apply to the type of connection set up; e.g. if the caller is not normally allowed access to a certain trunk group, then that same trunk group cannot be accessed if it were used as the forwarding connection (for personal Speed Call numbers).
- Trunk-to-trunk connections System options control the type of connections allowed in External Call Forwarding.
- Callers on ground start DID and DISA trunks can be forwarded to an external call-forwarded extension. Loop start trunks of this type will intercept to the supervisor.
- A loop start CO trunk will not be forwarded under any circumstance.
- A non-Dial-In trunk programmed as a Direct-In Line (DIL) can be forwarded externally if System Option 158 (Incoming to Outgoing Call Forward Enable) is enabled, and it is not loop start.
- A hands-free extension may not be the calling extension, but can forward external calls.
- CCSA trunks may not be forwarded to an external call.

Programming

- Select COS Option 97 (External Call Forwarding Connect Enable) for extensions which are to be forwarded.
- Select System Option 287 (Speed Call Enable).
- Select System Option 273 (External Call Forwarding Enable).
- Select COS Option 34 (Call Forwarding - Busy), COS Option 35 (Call Forwarding - Don't Answer) or COS Option 36 (Call Forwarding - Follow Me).
- Select System Option 158 (Incoming to Outgoing Call Forward Enable).
- Assign access codes to Features: 3 (Call Forward - Busy), 4 (Call Forward - Don't Answer), 5 (Call Forward - Follow Me) and 46 (Call Forward Busy - Don't Answer).

- Select System Option 107 (Supervisor CO to CO Trunk Connect) to allow the supervisor to connect incoming CO trunks to extensions with ECF.

Operation

To set up External Call Forwarding at an Extension:

- Lift the handset – dial tone is heard.
- Dial the Call Forwarding access code.
- Dial the System Speed Call access code.
- Dial the Speed Call table entry number, which contains the external telephone number to which calls are to be forwarded.
- Dial tone is returned if the above codes are valid (reorder tone is heard if the codes are invalid).
- Replace the handset – external call forwarding is now active.

To set up External Call Forwarding from the Console:

- Dial *11 nnn (where nnn is the extension number).
- Dial Call Forwarding access code (1, 2, 3 or 4).
- Dial the System Speed Call access code.
- Dial the Speed Call table entry number, which contains the external telephone number to which calls are to be forwarded.
- Dial tone is returned if the above codes are valid (reorder tone is heard if the codes are invalid).
- Press RELEASE button.

To cancel External Call Forwarding at an Extension:

- Lift the handset – dial tone is returned.
- Dial the Call Forwarding access code (1, 2, 3 or 4).
- Replace the handset – external call forwarding is now inactive.

To cancel External Call Forwarding from the Console:

- Dial *11 nnn (where nnn is the extension number).
- Dial #.
- Press RELEASE button.

External Interdigit Timeout (15 sec)

Description

This option if selected extends the interdigit timeout from 10 seconds to 15 seconds so that the ACD system RX will drop 15 seconds after the last digit dialed.

Conditions

None

Programming

Select System Option 172 (15 Sec External Interdigit Timeout).

Operation

None

Feature Access

Description

A supervisor, extension or trunk may access certain features by dialing an access code. The ability of an extension or trunk to access features is limited by their Class of Service.

Conditions

None

Programming

None

Operation

None

First Digit Toll Deny

Description

If this option is selected, Toll Denial applies only to the first, rather than the first two digits. A call is denied if the first digit dialed after accessing a trunk is 0, 1, # or *.

Conditions

None

Programming

- Select System Option 291 (Toll Control – First Digit).

Operation

None

Fixed Night Service

Description

This feature allows calls normally directed to the supervisor console to be routed to preselected extensions, hunt groups or common alerting devices when the system is in night service. After selection of night service, all calls directed to the supervisor are routed to the selected night assignment. Calls held in the supervisor queue when night service is selected, remain at the console and may be answered in the normal manner. The system provides two independent night service assignments, NIGHT 1 and NIGHT 2. The calls are directed to the assignment selected.

Conditions

- The assignment of trunks may not be changed from the supervisor console (see Flexible Night Service).

Programming

- Assign incoming trunks to the required extensions, hunt groups or common alerting devices when programming the trunks.

Operation

- Press the NIGHT 1 button on the supervisor console to select Night Service 1 assignments.
- Press the NIGHT 2 button on the supervisor console to select Night Service 2 assignments.

Flash Disable

Description

This feature inhibits a switchhook flash from an extension. All features using the switchhook in the selection of the feature are therefore inhibited.

Conditions

- Class-of-Service Option 46 (Flash Disable) and Class-of-Service Option 62 (Flash for Supervisor) are mutually exclusive.

Programming

- The COS of the extension must contain Option Number 46 (Flash Disable).

Operation

None

Flash for Supervisor

Description

An extension with this option specified in its COS will automatically ring the supervisor console if the switchhook is flashed while in an established call. The call will appear at the console as a Dial 0 call.

Conditions

- The extension cannot access any other feature requiring a switchhook flash, e.g. "Broker's Call" or "Transfer/Add-On/ Conference".

Programming

- The COS of the extension must include Option Number 62 (Flash for Supervisor).

Operation

- While on an established call, flash the switchhook – the extension rings the supervisor console, the other extension will be placed on hold.

Flexible Night Service

Description

This option allows the supervisor to change the night service assignment of trunks associated with extensions or hunt groups. The system allows full flexibility of trunk assignment: all trunks may be assigned to one extension, each trunk may be assigned to a different extension or a hunt group.

Conditions

- Dial "0" calls and DID/Dial-In/CCSA trunk calls can be programmed for night service assignments. Dial "0" calls and DID/Dial-In/CCSA calls may be assigned to a night station or a night bell using flexible night service.
- Trunks must already be programmed for assignment to an extension, or hunt group during night service.
- Trunks programmed for assignment to night bells cannot be changed by the supervisor.

Programming

- Specify System Option 156 (Flexible Night Service).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

For Flexible Night Service Assignment:

- Dial *3.
- Dial the individual trunk access number (equipment number) or dial 0, 1, 2 or 3.
- Press the NIGHT 1 or NIGHT 2 button. The existing extension or a hunt group assignment is displayed.
- Dial the extension number, bell or a hunt group master number to which the trunk is to be assigned.
- Press the RELEASE button.

Flexible Numbering Plan

Description

The numbering plan used within the system is completely flexible. The user may select any combination of 1, 2, 3 and 4 digit numbers. The only constraint in the selection of a numbering plan is that it does not conflict with an access code.

Conditions

- First digit conflict between the access codes assigned to Executive Busy Override and the Callback - Busy features, and other numbers within the numbering plan, are permitted.
- * and # are valid digits within the system numbering plan.

Programming

- Assign the required extension numbers and access codes.

Operation

None

GUEST ROOM Button

Description

The console GUEST ROOM button, when enabled, allows the supervisor to display the current status of a room. The status display shows:

- SOURCE display shows the extension number of the room and the number of local call units made from the room.
- DESTINATION display shows the current room status code (1-4).
  1 - Room vacant and ready to be occupied
  2 - Room occupied and clean
  3 - Room vacant but not ready to be occupied
  4 - Room occupied but needs cleaning
  A period displayed after the room status code indicates that the maid is currently in the room.
- If the DO NOT DSTB LED lights, the room has Do Not Disturb set.
- If the MSGE WAIT LED lights, the room has a message waiting.
- If the ROOM RESTR LED is lit or if the room status code is 1 or 3, Controlled Outgoing Restriction is enabled and the ROOM STATUS button enabled, Controlled Outgoing Restrictions are in effect for that extension.
- See "Do Not Disturb", "Maid In Room", "Message Registration", "Message Waiting", "Message Waiting Lamp", "Room Status", "Automatic Wake-Up (Alarm Call)" and "Controlled Outgoing Restrictions" descriptions.
- If Automatic Wake-Up is in effect, the time of the wake-up will appear in the Destination Display.

Conditions

- System Option 113 (GUEST ROOM Button Enable) and System Option 120 (Supervisor Serial Call) are mutually exclusive.

Programming

- Select System Option 113 (GUEST ROOM Button Enable) must be selected.
- If the room status is to be displayed, Select System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable).
- If Message Registration is to be displayed and/or printed out, select System Option 192 (Message Registration Enable).
- If the Room Status of an extension is to be displayed and changed, its COS must contain Option Number 80 (Room Status Applies).
- If the extension is to display Message Waiting, its COS must contain Option Number 77 (Message Waiting Applies).
- If the local CO call units are to be accumulated for the extension, the COS of the extension must contain Option Number 64 (Message Register).

Operation

- Press the GUEST ROOM button.
- Dial the required extension number – the console displays the status of the room (see Description).
- Press the RELEASE button – the console is idle.

Hands-Free Operation

Description

A "Hands-Free" extension is one which is placed in the off-hook condition (for 15 seconds) and allowed to enter the "HANDS-FREE IDLE" state. At this time, due to a COS option being set in its Class of Service, a call may be put through to this extension. Alternately the extension may dial the Hands-Free access code. A caller will receive 1 second of ringback and then be connected to the station. The called party will also hear 1 second of ringback tone to indicate that a call is coming through. They are then connected. At the termination of a call, the called party (with the "hands-free" phone) will hear 1 second of miscellaneous tone to indicate that the calling party has hung up. The "hands-free" phone is placed back into the "HANDS-FREE IDLE" state, and may receive a new call. To originate a call, the "hands-free" extension must first go on-hook to return to the "Idle" state and may then originate a call in the standard manner.

Conditions

- A hands-free station, if a member of a hunt group, can receive a call via the hunt group when it is in the normal on-hook idle state; but not if it is in the hands-free off-hook idle state.
- Calls to a hands-free station are only valid from another station, a DISA station (not using a loop start trunk) or a tie trunk. Calls from a DID trunk or using a loop start trunk will receive reorder tone. The DID trunk will intercept to the supervisor if the option for this is set. The supervisor may call and may have a ground start CO trunk as a source, but not a DID trunk.
- A hands-free station may have Call Forwarding - Don't Answer in its COS. However it will only work if the station is in the on-hook idle state at this time.
- A callback will not be honored at a hands-free station if the station is not on-hook at the time callback is activated.
- A callback-busy set up by a station calling a hands-free station will be honored.
- A hands-free station cannot be transferred into busy or ringback by another transfer.
- Two hands-free stations may not be connected together (e.g. via a supervised transfer).
- A conference cannot be sustained with hands-free stations only.
- A hands-free station cannot be locked out.

Programming

- System Option 274 (Hands-Free Enable) must be set for this feature.
- Class-of-Service Option 99 must be set for those stations which are to have the hands-free feature.
- Assign a Feature code to Feature Number 45 (Hands-Free).

Operation

To answer a Call:

- Ringback tone is heard for a 1 s period, after which the hands-free station is able to talk to the caller.
- On completion of the call, after the caller goes on-hook, the hands-free station will hear a 1 s burst of miscellaneous tone (indicating that the caller did go on-hook).
- The hands-free station is now in a hands-free idle state and able to receive another call.

To make a Call:

- The hands-free station user goes on-hook, then goes off-hook and makes the call in the normal manner.
- When the call terminates, the hands-free station has the following choices:
  - Remain off-hook, in which case 5 seconds after the called party has gone on-hook, the hands-free station will go to the idle hands-free mode.
  - Go on-hook then off-hook, to go in the idle hands-free mode.

Hold Pickup

Description

The Hold Pickup feature allows an extension user to pick up a call held at the supervisor console on one of the console HOLD keys. If a single console is employed, four HOLD buttons (HOLD buttons 1 through 4) are provided. A second console provides four additional HOLD positions (HOLD buttons 5 through 8).

Conditions

- Hold 4 and Call Blocking are mutually exclusive.

Programming

- The COS of the extension must include Option Number 55 (Hold Pickup).
- Assign an access code to Feature Number 12 (Hold Pickup Access).

Operation

After being informed that a call is being held on a specified HOLD button:

- Lift the extension handset – dial tone is returned.
- Dial the Hold Pickup access code followed by the number of the HOLD button specified – the call is removed from the console and connected to the extension. All features normally associated with the extension may be accessed normally.

Hot Line

Description

This feature enables a Manual Line (COS Option 57) to be set up as a Hot Line. Upon going off hook a preprogrammed speed call number (internal or external) will be automatically dialed.

Conditions

The extension must be programmed as a Manual Line. (COS Option 57 must be enabled).

Programming

The Supervisor must program Call Forward Follow-Me for that extension using the *11 console function. See Section MITL9105/9110-090-315-NA, Supervisor Console Description.

Operation

Lift handset, speed call will automatically be dialed.

Hunting

Description

Master number hunting allows a user to dial an access code (the master hunt number of the hunt group), and have the call completed to the first idle extension in that hunt group. Any extension within a hunt group may be accessed directly by dialing the extension number; hunting will not take place if the extension is busy. Three types of hunting are provided by the system: Circular, Terminal and Secretarial hunting. Trunks may also be placed in circular or terminal hunt groups.

Circular Hunting starts at the extension after the last extension in the hunt group to which a call was completed (the extension rung), and hunts over all extensions in the hunt group in the sequence programmed. Hunting stops at the first idle extension found. If all extensions are busy, the calling extension hears busy tone, and may camp-on to the hunt group. A Dial-In trunk receives ringback, while a transferred trunk will receive Music On Hold if provided.

Terminal Hunting starts at the first extension in the hunt group and terminates at the first idle extension found. Hunting takes place in the order in which the extensions were programmed into the hunt group.

Secretarial Hunting is the same as terminal hunting, except that the terminating extensions (the secretarial positions) are the same for more than one hunt group.

Conditions

- All extensions must be programmed before programming the hunt group.
- The hunt group access code must be unique and must not conflict with the system numbering plan trunks may be directed to a hunt group.
- A maximum of 12 independent hunt groups may be defined.
- If an extension appears in more than one hunt group, (secretarial hunting) the numbers following the extension must be identical and in the same sequence in each hunt group that the extension appears in.
- Extensions cannot be in more than one circular hunt group.
- An extension with Do Not Disturb set, one which is busied-out, or one which is in the hands-free idle state, will be passed in the hunt.
- SUPERSETs must not use the AUTO ANSWER mode when programmed into Hunt-Groups.

Programming

- Program all extensions.
- Program the hunt group. If Circular Hunting is required, the last equipment number entered must be identical to the first entry.

Operation

None

Identified Trunk Groups

Description

When an identified trunk group is accessed, the trunk group access code is repeated as the first digit (or digits) dialed into the trunk. For example, if the trunk access code is 2, and the digits 35 are dialed, the trunk will be seized when the digit 2 is dialed. The 2 will be repeated to the trunk, followed by the digits 3 and 5. The equipment (usually a PBX) at the other end of the trunk will see the digits 235.

The purpose of the repeating digits is to allow a common numbering plan between two or more systems. In the above example, an extension numbered 235 could be accessed from the ACD system in which it was programmed, or from another system with an identified trunk group which is seized by dialing the digit 2.

Trunk group one can have more than one access code; a maximum of ten different codes are allowed. If programmed as an identified Trunk Group, each code will be repeated and may be part of an extension number or feature. Alternatively, the leading digit or digits may in turn seize other trunk groups allowing tandeming between two or more switches.

Conditions

- This feature applies to calls from extensions, dial-in trunks or the supervisor.
- This feature applies to outgoing, non-CO rotary trunks only.
- A Camp-On or Callback cannot be made to an Identified Trunk Group.
- System Option 157 (Identified Trunk Group Enable) requires that the last two digits in the four-digit trunk group type be "13", in order to define the trunk group as a non-CO trunk group with identification, and to perform tone-to-pulse conversion if tone extensions are to be used without waiting for dial tone.

Programming

- Select System Option 157 (Identified Trunk Group Enable).
- Program required Trunk Groups.
- If multiple Trunk Group Access is required, assign a maximum of ten access codes to Feature Numbers 33-42 for access to Trunk Group 1 only.

Operation

- Dial the appropriate number - ringing tone is returned from the tandem office.

Illegal Access Intercept Supervisor

Description

Calls to nonprogrammed or restricted access codes or extension numbers will be routed to the supervisor. Calls routed to the console in this way appear as Dial 0 calls, with the INT indicator lit in the SOURCE display, defining the calls as intercept calls. See also Vacant Number Intercept to Supervisor, and DID/Dial-In/CCSA Vacant Number Intercept to Supervisor.

Conditions

- During Night Service (NIGHT 1 or NIGHT 2), all intercept calls receive reorder tone, regardless of the options selected.

Programming

- To cause all calls to restricted numbers or nonprogrammed access codes, other than DID or Dial-In tie trunk calls, to be routed to the Supervisor, select System Option 136 (Intercept to Sup.-Illegal Access). If this option is not selected, such calls will receive reorder tone.

Operation

None

Immediate Ring

Description

Ringing is applied to a called free extension number within 100 ms of the last digit in the number being dialed.

Conditions

None

Programming

None

Operation

None

Incoming Trunk Call Rotary Only

Description

This Option has been added to eliminate receiving digits twice on tie trunks from PBX's. In some tandem situations the outpulsing system may send both tones and rotary digits. With this COS Option in a tie trunk's COS, a tie trunk will ignore incoming DTMF signaling.

Conditions

- This COS Option applies only to incoming trunk calls.

Programming

- Select COS Option 95 (Incoming Trunk Rotary Dial Only) in the tie trunks COS.

Operation

None

Individual Trunk Access

Description

This feature allows the supervisor to access individual trunks within a trunk group.

Conditions

None

Programming

- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

- Dial *20.
- Dial the individual trunk access number (equipment number of the trunk).
- Dial * – CO dial tone is returned if the trunk is free. ACD busy tone is returned if the trunk is busy.

Inhibit Automatic Supervision

Description

This System Option applies to tie trunks dialing a CO trunk through the ACD system. Some networks require all CO answer supervisions be passed back to the tie trunk. This option will allow CO supervision to be passed back to the tie trunk.

Conditions

- If this System Option is enabled and the Trunk Group is programmed as "Provide Answer Supervision", no automatic supervision is generated by the system.

Programming

- Program the appropriate Trunk Groups as "Provide Answer Supervision".
- Select System Option 159 (Inhibit Automatic Supervision).

Operation

None

Limited Wait for Dial Tone

Description

This option, when set, causes the "Wait for Dial Tone" feature on outgoing trunks to wait only 5 seconds and then enable outgoing audio even if no dial tone is received.

Conditions

None

Programming

- Select System Option 160 (Limited Wait for Dial Tone).

Operation

None

Line Lockout

Description

The supervisor may be alerted that an extension has gone off-hook and timed-out (not dialed within a certain period), by the console tone ringing and the minor (MIN) alarm LED flashing. Upon pressing the ALARM RESET button, the SOURCE display shows E099 and the equipment number. The DESTINATION display shows the extension number and LO for locked out (see also Automatic Station Release).

Conditions

- A hands-free station cannot be locked out.

Programming

- Select System Option 115 (Supervisor Lockout Alarm Enable).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

- Console tone ringer rings and minor (MIN) alarm LED flashes.
- Supervisor presses the ALARM RESET button - SOURCE and DESTINATION displays display information.
- Once the problem has been corrected, the supervisor may cancel the error by dialing *8 # (where * is the Supervisor Function) and pressing the RELEASE button.

Listed Directory Numbers (LDN)

Description

The supervisor console will identify Listed Directory Numbers (LDN's) at the console. Each Listed Directory Number may be assigned to a separate LDN button (1-4), allowing the supervisor to answer the incoming call with the correct response.

Conditions

- Only CO or Non Dial-In Trunks may be assigned to LDN appearances.
- DID/CCSA trunks appear on LDN 4 when accessing the supervisor.

Programming

- Assign the trunk to the required LDN button number when programming the trunk.

Operation

None

Lockout Alarm

Description

This system option causes a minor alarm to come up at the supervisor console when an extension is locked out.

Conditions

- Dial tone time-out is 15 seconds, with an additional 30 seconds of reorder tone before a lockout is applied to the extension, unless the extension is programmed as "Hands-Free".
- Interdigit time-out is 10 seconds for lines, 15 seconds for trunks with an additional 30 seconds of fast busy tone before a lockout is applied to an extension.

Programming

- Select System Option 115 (Supervisor Lockout Alarm Enable).

Operation

None

Maid in Room

Description

This feature allows the maid to change the status of the room from the room's telephone, and also to indicate on the supervisor console which room the maid is in (see Room Status).

Conditions

- A busy lamp number must be assigned to the extension, in order to display its status in the busy lamp field.

Programming

- Select System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable).
- The COS of the extension must contain Option Number 80 (Room Status Applies).
- An access code must be assigned to Feature Number 28 (Room Status Update Maid in Room).

Operation

At the extension in the room:

- Dial the Maid In Room access code.
- Dial one of the following codes:
  - 1 – changes room status display to show the maid in the room.
  - 2 – clears maid-in-room indication and leaves room status code unchanged.
  - 3 – clears maid-in-room indication and changes room status from "needs cleaning" to "clean".
  - – Dial tone is returned.
- Replace handset.

Manual Line

Description

An extension with this option specified in its COS is routed directly to the supervisor console when going off-hook. The extension can receive calls, but all call originations must be made with the assistance of the supervisor.

Conditions

- The extension does not receive dial tone, but will receive ring-back tone.
- Manual line service cannot be used with console-less operation.

Programming

- Option Number 57 (Manual Line) must be specified in the COS of the extension.

Operation

None

Meet-Me Conference

Description

The Meet-Me Conference feature allows up to seven extensions to dial the Meet-Me Conference access code at a specified time, and to be connected into a conference. As each conferee joins the conference, a single 200 ms burst of a 440 Hz tone is superimposed on the conference. When a conference is full (seven conferees), parties trying to enter the conference receive busy tone.

Conditions

- A maximum of seven conferees may be in a conference.
- Only one Meet-Me Conference may be active at any time.
- Switchhook flash cannot be used by an extension in a Meet-Me Conference – the extension will be dropped from the conference upon flashing the switchhook.
- The supervisor cannot dial into a Meet-Me Conference.
- Only extensions and DISA trunks may access a Meet-Me Conference.

Programming

- All extensions accessing the feature must have Option Number 50 (Meet-Me Conference) specified in their COS.
- Assign an access code to Feature Number 9 (Meet-Me Conference). This access code must not conflict with the system numbering plan.

Operation

- Dial the Meet-Me Conference access code – if you are the first person in the conference, you will hear music, if provided, or nothing if Music on Hold is not provided. As each conferee joins the conference, a warning tone is heard and the new conferee is added to the conference.
- To leave the conference – replace the handset. The last party in the conference hears music if Music on Hold is provided.

Message Registration

Description

This feature allows the system to accumulate the number of completed local call units made from an extension. The number of call units counted for each call is dependent on the call unit modifiers selected. The accumulated call unit counts are held in the system message registers. These registers are protected against power failure, so that call counts are not lost in the event of a power outage. When the message register overflows, a minor alarm will be raised at the console.

Conditions

- The DESTINATION display can show a value of up to 9999. After this, decimal points are lit in sequence starting from the right of the display, to indicate an increment of 10,000; e.g. a display of 43. 2.8. is actually 4328 + 10,000 + 10,000 + 10,000 or 34328. The maximum count that may be displayed is 49999.
- The maximum count which may be printed is 65535.

Programming

- The COS of the extension for which a call unit count is to be accumulated must contain COS Option Number 64 (Message Register).
- Select System Option 192 (Message Registration Enable).
- If all supervision signals except pseudo answer supervision are to be counted, select System Option 193 (Message Registration: Count Additional Supervisions). If this option is not selected, only the first supervision received is counted.
- If the CO trunk does not supply answer supervision, pseudo answer supervision will be generated after 20 seconds if System Option 194 is selected, or after 40 seconds if System Option 195 (Message Registration: Timer = 40 seconds) is selected. If neither of these options are selected, pseudo answer supervision is generated after 30 seconds. If both options are selected, pseudo answer supervision is generated after 60 seconds.
- If any one of System Options 199 through 206 are programmed, the selected surcharge is added to the first answer supervision signal received. If none of these options are selected, no surcharge is made.
- If any one of System Options 196 through 198 are selected, the contents of the message register is multiplied by the selected multiplier (2, 3, or 4) when the content of the message register is displayed.
- Select System Option 113 (GUEST ROOM Button Enable).
- The first digit of the TYPE code for the trunk groups used, must be programmed as Type 1 if answer supervision is not generated by the CO (No Supervision), or Type 4 (Outgoing Audio Inhibit Until Answer Supervision) may be used if answer supervision is provided. The second digit of the trunk group type must be specified as either 2 (Message Register) or 4 (SMDR plus Mes-

sage Registration). If the trunk group is not programmed for answer supervision, pseudo answer supervision will be automatically generated.

Operation

- Press the GUEST ROOM button.
- Dial the extension number of the room - the SOURCE display shows the number dialed and the number of call units made from that extension. The DESTINATION display shows ROOM STATUS if System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable) is selected.
- To clear the message register, press the # button.
- Press the RELEASE button.

Message Register Audit

Description

This feature allows the supervisor to request a printed list of all extensions that have made local calls, and the total number of call units made from each extension. The printout format includes date, time, extension number and the message register value for each extension.

Conditions

- The printer must be compatible with the requirement for an RS232 port, with a data speed of 300 or 1200 baud and a minimum of 80 characters per line.
- The request will be ignored if the printer queue is full.
- The second digit of the trunk group type must be 2 or 4.
- Assign an access code to Feature Number 18 (Supervisor Function) usually as indicated under Operation.

Programming

- Select System Option 316 (Room Message Register Audit Enable).
- Select System Option 318 (Zero Message Register after Room Register Audit) if the message register are to be cleared after its contents have been printed.

Operation

- Dial *16.
- Press the RELEASE button – the display clears and the report is printed (listing is in equipment number sequence).

Message Waiting

Description

This feature allows the supervisor to inform a guest that there is a message waiting. The message waiting indication may take the form of a continuously flashing lamp on the extension, or the extension may be rung every 20 minutes with a distinctive ringing pattern (3 cycles of 3.5 ips ringing). If the extension is busy, or has Do Not Disturb active when Message Waiting is activated, the message waiting indication is initiated as soon as the extension becomes idle. If the message waiting indication is given by a lamp, the lamp flashes (at 60 ipm). If the message waiting indication is given by ringing the extension, the first ring starts 10 seconds after the extension becomes idle. The extension will ring every 20 minutes (after an off-on hook condition if the extension was busy or had Do Not Disturb set) or until the message waiting is cancelled. When the guest returns and calls the supervisor, the MSGE WAIT lamp lights to indicate that there is a message waiting for that extension.

Conditions

- System Option 275 (Message Waiting Setup - Bell) and System Option 276 (Message Waiting Setup - Lamp) are mutually exclusive.
- See Message Waiting Print.
- The MSGE WAIT lamp will not light if the BOTH MODE button is pressed.

Programming

- Select System Option 275 (Message Waiting Setup - Bell) or 276 (Message Waiting Setup - Lamp).
- Select System Option 113 (GUEST ROOM Button Enable), if Message Waiting is to be turned on and off without calling the room.
- Select System Option 112 (Supervisor Do Not Disturb and Message Waiting Display), if the special message waiting display is to be used.
- The COS of extensions to which message waiting is to be applied must include COS Option 77 (Message Waiting Applies).

Operation

To set up with the GUEST ROOM button:

- Press the GUEST ROOM button.
- Dial the extension number.
- Press the MSGE WAIT button.
- Press the RELEASE button.

To set up without the GUEST ROOM button:

- Dial the extension number.
- Press the MSGE WAIT button.
- Press RELEASE.

To cancel:

- Repeat the above steps accordingly. When the MSGE WAIT button is pressed, it will be cancelled.

Message Waiting Display

Description

This feature allows the supervisor to display all extensions that have a Message Waiting. When the supervisor presses and holds the MSGE WAIT button, the busy lamp field goes dark, leaving only the lamps lit for the rooms that have a Message Waiting. In addition, the SOURCE display shows the total number of extensions with a Message Waiting.

Conditions

- The console must be idle. If the console has an extension as its Source or Destination party or is using the GUEST ROOM button, the Message Waiting status for that extension will be changed.
- For an extension to be included in the total display of the Busy Field Lamps and the total amount in the SOURCE display, it must have a lamp assigned a Message Waiting.

Programming

- Select System Option 112 (Supervisor Do Not Disturb and Message Waiting Display).

Operation

To display the total number of extensions with Message Waiting set:

- Press the MSGE WAIT button – the busy lamp field changes to display only the extensions that have a Message Waiting active, the SOURCE display shows the total number of extensions with a Message Waiting.
- Release the MSGE WAIT button – the busy lamp field and SOURCE display return to normal.

Message Waiting Print

Description

The message waiting status of a room can be printed whenever the supervisor changes the status of the room.

Conditions

- See Message Waiting.
- If the printer is occupied, the status does not change and a warning beep is returned.

Programming

- Select System Option 312 (Message Register and Message Waiting Change Print Enable).
- See Message Waiting.

Operation

If Message Waiting is set up or removed, it will be recorded as: extension number, date, time and one of the two following:

- MESSAGE WAITING ON
- MESSAGE WAITING OFF

Mixed Station Dialing

Description

This feature allows the simultaneous use of rotary and DTMF telephones. All features provided to telephones.

Conditions

None

Programming

None

Operation

None

Multi-Console Operation

Description

In systems employing two supervisor consoles the following features apply:

- All calls appear on both consoles.
- Either supervisor may answer any call.
- Supervisor 1 may hold calls on HOLD buttons 1, 2, 3 and 4.
- Supervisor 2 may hold four additional calls on HOLD buttons 5, 6, 7 and 8.
- Either supervisor may select night service for the system.

Conditions

- Calls can be transferred from one console to the other by holding the call on one console, then dialing the appropriate Hold Pickup code from the other console.

Programming

None

Operation

- All operations are identical for both supervisor consoles.

Multi-Digit Toll Control

Description

Multi-Digit Toll Control provides a method of controlling the sequence of digits which an extension may dial into a trunk. Toll Control is applied on an extension basis; that is, the control applied to digits can vary depending on which extension has accessed the trunk. Should no toll restrictions on an extension be required, the extension may be Toll Allowed; i.e., dialing is unrestricted. For further information see Section MITL9105/9110-090-212-NA, Multi Digit Toll Control.

Multiple Extensions

Description

A maximum of seven extensions with bells may be connected (hardwired) together.

Conditions

- If more than one extension is off-hook, a drop in audio level will occur.

Programming

None

Operation

None

Multiple Trunk Groups with Overflow

Description

The system permits up to twelve independent trunk groups to be defined. Each trunk group may be specified to overflow to another trunk group when all trunks in the called group are busy. Extensions may be prevented from using the overflow group on an individual extension basis. See COS Option Number 52 (Do Not Overflow), Trunk Groups.

Conditions

- A trunk may be a member of only one trunk group.
- All trunks within a trunk group must be of the same type.
- If an overflow group is specified, the trunks in the overflow group should be of the same type as the originating group.

Programming

- Program the overflow option of the trunk group as the number of the group to which extensions are to overflow.
- Assign the originating trunk group option (65-76) to the extension's COS. It is not necessary to put the overflow trunk group into the COS.
- Assign Option Number 52 (Do Not Overflow), if required, to the COS of the extension.

Operation

None

Music on Hold

Description

A music source may be connected to the System via the cross-connect field for use with Camp-On and Hold features. If music is not provided, calls that are held or camped-on will hear nothing.

Conditions

- The music source should be between 50 and 500 mVrms.
- Input to the system is 600 ohms AC transformer coupled. A DC voltage should not be applied to this input.

Programming

- See Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation for wiring details.

Operation

None

Music on Hold Disable

Description

This option should be selected if Music on Hold is not provided. It will leave a trunk or extension in a suspended state. That is the party on hold will not be on any speech path.

Conditions

- System Option 161 (Music on Hold Disable) and System Option 247 (Automatic Wake-Up Music on Hold) are mutually exclusive.

Programming

- Select System Option 161 (Music on Hold Disable).

Operation

None

Never a Consultee

Description

This Class-of-Service feature denies an extension the ability to be dialed from extensions that have a call on hold or are part of a conference call.

Conditions

None

Programming

- The COS must contain Option Number 47 (Never a Consultee).

Operation

None

Never a Forwardee

Description

Inclusion of this feature in an extension's Class of Service prevents an extension from having any calls forwarded to it by an extension. If an extension attempts to forward a call to an extension with this option in its COS, he will receive reorder tone or intercept to the supervisor. Calls directed to the extension by hunting are not affected by the selection of this feature.

Conditions

None

Programming

- The COS of the extension must include Option Number 38 (Never a Forwardee).
- Select System Option 136 (Intercept to Sup.-Illegal Access) if forwarded calls are to be intercepted by the supervisor.

Operation

None

New Call Tone

Description

If this option is selected, the first call placed in the supervisor call waiting queue when the console is not free, signals the supervisor with a single burst of tone. Subsequent calls do not alert the supervisor when they are added to the queue. Their presence is shown by the CW (Call Waiting) indicator. If the option is not selected, incoming calls do not signal the supervisor until the console is free.

Conditions

None

Programming

- Select System Option 116 (Supervisor New Call Tone Enable).

Operation

None

Night Service Automatic Switching

Description

This feature automatically switches the system into Night Service if an incoming call or recall to the supervisor console is not answered within the selected Night Service Time-Out period.

Conditions

- A new call causing the system to switch to Night Service remains at the supervisor console.
- If the trunk was programmed to a night bell in Night Service, then it will appear on the bell. If it was programmed to an extension, it will not be rerouted to the extension.
- A recall will remain on the supervisor console, but will not appear on a night bell.
- The console must not be active during the Night Service Time-Out period. If the supervisor presses any console button, the time-out is cancelled.
- All calls in progress when Night Service is selected are not affected.
- Depressing the NIGHT key to terminate the night mode also terminates further Night Service Automatic Switching timing on a unanswered incoming trunk call.

Programming

- Select System Option 163 (Night Service Automatic Switching).
- If System Option 164 is selected, the time-out period is 20 seconds.
- If System Option 165 is selected, the time-out period is 40 seconds.
- If neither System Option 164 nor 165 is selected, the time-out period is 30 seconds.

Operation

None

No Dial Tone

Description

Assignment of this feature to a dial-in tie trunk suppresses dial tone on an incoming trunk call. If this feature is assigned to an extension, the extension will not receive dial tone when going off-hook.

Conditions

None

Programming

- The COS assigned to a tie trunk or an extension must contain Option Number 61 (No Dial Tone).

Operation

None

Non-CO Trunk via Supervisor Inhibit

Description

This option denies an extension the ability to access a Non-CO Trunk through the supervisor.

Conditions

None

Programming

- The COS of the extension must contain Option Number 59 (Non-CO Trunks via Supervisor Inhibit).

Operation

None

Non Volatile RAM Battery Alarm

Description

On a power-up reset, there is a test performed to check the status of the NVR battery back-up. If the battery switch is OFF, a MAJOR alarm E023-20 will be raised. The destination will display a "1". During diagnostics a battery test is run approximately every 5 minutes. If a problem exists a MINOR alarm E023-20 will be raised. The destination will display a "2" if the voltage is out of tolerance.

Conditions

The batteries can refresh the RAM for an entire week if the card is not connected to a system.

Programming

None

Operation

None

Off Premise Extension

Description

An extension having COS Option 112 will be classified as an Off Premise Extension and will have its gain increased for two party conversations. For 3 or more party conversations COS Option 119 (Low Gain Conference Enable) should be enabled.

Conditions

None

Programming

Select COS Option 112 (Off Premise Extension).

- Select COS Option 119 (Low Gain Conference Enable) for 3 or more party conversations.

Operation

None

Originate Only

Description

An extension with this COS option may originate calls, but cannot receive any calls dialed to its number unless they are forwarded. If calls are dialed to the extension, the calls are intercepted and routed to the supervisor or to reorder tone.

Conditions

- An extension with this COS option may receive calls via Call Forwarding (unless Never a Forwardee is selected in its COS).
- An Originate Only extension may receive calls via a master hunt group number.

Programming

- The extension's COS must include Option Number 44 (Originate Only).

Operation

None

Outgoing Trunk Callback

Description

Outgoing Trunk Callback allows the supervisor or an extension user who receives a busy signal after dialing a trunk group access code, to have the call completed when a trunk in the called trunk group becomes free. When a trunk becomes free, the system seizes the required trunk and rings the originating party (see Automatic Callback).

Conditions

- A callback will always ring the originating extension; call forwarding has no effect.
- Up to 30 callback requests may be active within the system at any time.
- If the trunk group is accessed before the callback is honoured, the callback will be cancelled automatically.
- Duplicate callback requests are ignored (the original callback request is cancelled).
- The Callback – Busy access code must be dialed within 10 seconds of receiving busy tone.
- If a callback is not answered by the originating extension within 6 rings, it is automatically cancelled.
- If the called trunk group becomes busy before the originating party answers the callback, the originating party will hear busy tone and may dial the callback code again.
- The supervisor may cancel all callback requests by dialing *4 # and pressing the RELEASE button.
- All callback requests are lost after recovery from a power failure.
- Attempting to set up a callback on an identified trunk group will result in reorder tone being returned.
- Callbacks are not effective if Account Codes are used.

Programming

- Select System Option 208 (Outgoing Trunk Callback).
- Select COS Option Number 33 (Automatic Callback).
- Assign an access code to Feature Number 23 (Callback – Busy).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

To activate Callback:

- Dial the trunk group access code – busy tone is returned.
- Dial the Callback – Busy code – dial tone is returned or the supervisor presses the CALLBACK button, then the RELEASE button.
- Replace handset.

To answer a Trunk Callback at the supervisor console:

- The ANSWER and the RECALL lamps flash.
- Press the ANSWER button – the ANSWER, CALLBACK and DEST lamps light, and CO dial tone is returned.
- Dial the required number.

To answer a Trunk Callback at an extension:

- The extension rings.
- Lift the handset – CO dial tone is returned.
- Dial the required number.

Outgoing Trunk Camp-On

Description

When an extension user who is equipped with the Camp-On feature reaches a busy trunk group, he receives a special busy tone (350/440 interrupted at 60 ipm). If the originating extension remains off-hook for 10 seconds, the special busy tone changes to regular busy tone. When one of the trunks in the group becomes free, the caller is connected to the trunk and receives Central Office dial tone.

Conditions

- The supervisor or extensions cannot Camp-On to Identified Trunk Groups.
- This feature conflicts with System Option 230 (Account Code Enable).
- Camp-On is not effective if Account Codes are used.

Programming

- The COS of the extension must include Option Number 51 (Camp-On).
- Select System Option 209 (Outgoing Trunk Camp-On).

Operation

- Dial the trunk group access code - special busy tone is returned.
- After 10 seconds - standard busy tone is returned.
- When a trunk becomes free, Central Office dial tone is returned.

PAGE Button

Description

Selection of this option enables the PAGE button on the supervisor console to be used. When the PAGE button is pressed, the console handset is connected directly to both zones of the paging equipment, overriding any extension announcement in progress. The supervisor may access either of the individual paging circuits by dialing the required paging access codes (see Paging Access).

Conditions

- Access to two paging zones is provided.
- When shared consoles are in use, the second console will receive busy tone when pressing the PAGE button, if it is in use by the first console.
- Audio output level is approx. 100 mVrms.
- Output is 600 ohms, transformer coupled. No DC voltage should be applied to this output.
- Amplifier and loudspeaker equipment are customer-provided, and are external to the system equipment.
- A dry relay contact is provided for amplifier control purposes for each zone (see MITL9105/9110-090-200-NA), Shipping, Receiving and Installation.

Programming

- Select System Option 117 (PAGE Button Enable).
- If individual access to paging circuits is required, access codes must be assigned to Feature Numbers 10 and 11 (Pagers 1 and 2).

Operation

- Press and hold down the console PAGE button – the console handset is immediately connected to both paging zones, overriding any extension announcement in progress.
- When the paging equipment is in use by the console or an extension, the PAGE LED on the console is lit indicating to the supervisor that an announcement is being made.

Paging Access (Extensions)

Description

An extension equipped with this feature is permitted access to the system paging equipment by dialing the required access code. Access may be restricted to zone 1 only, zone 2 only, or to both zones 1 and 2, depending upon the access code dialed. If an extension tries to access busy paging equipment, busy tone is returned.

Conditions

- A maximum of two paging circuits are provided.
- Camp-On or Automatic Callback - Busy may not be activated on busy paging equipment.
- Any extension paging announcement may be overridden by the supervisor.
- Paging amplifiers and loudspeakers are customer-provided equipment.
- A dry relay control is provided for amplifier control purposes for each zone (see MITL9105/9110-090-200-NA), Shipping, Receiving and Installation.
- If the supervisor overrides an extension, the extension will receive busy tone.

Programming

- Option Number 53 (Paging Access) must be included in the COS of the extension.
- Assign an access code to the paging access required:
  - Pager 1 - Feature Number 10
  - Pager 2 - Feature Number 11
  - Pagers 1 and 2 - Feature Number 13.

Operation

- Dial the required paging access code - after the short pulse of tone is heard, you are connected to the paging system and may make the required announcement.

Pickup Groups

Description

An extension may be programmed into a Pickup Group permitting it to pick up a call within that group. See Dial Call Pickup.

Power Failure Transfer

Description

In the event of a common control or power failure which would cause a major loss of call processing, preselected CO trunks are automatically switched to designated extensions. Failure transfer may be selected automatically under control of the system, or manually by setting the console or maintenance panel transfer switches to TRANSFER. When normal system operation is restored, calls on transfer circuits remain in effect until the calls are terminated, then the circuits are returned to normal operation. The POWER FAIL TRANSFER (PFT) control switches on the Maintenance Panel may be used to locate and isolate the source of Transfer condition. (See also Section MITL9105/9110-096-500-NA General Maintenance Information).

Conditions

- A maximum of six transfer circuits are provided by the SX-100.
- A maximum of 12 transfer circuits are provided by the SX-200.
- If a transfer takes place, calls on the transferred trunks and extensions are dropped.
- When the system is returned to normal, existing PFT trunk calls will not be dropped.

Programming

None

Operation

Manual Transfer:

- Set the console transfer switch to the TRANSFER position. The corresponding Maintenance Panel POWER FAIL TRANSFER CONTROL SWITCH must be set to ENABLE.

Power Supply Requirements

Description

The SX-100/SX-200 ACD systems are designed to operate from 120 Vac or 220 Vac, 47 to 63 Hz. The SX-200 requires factory strapping to operate from 220 Vac. Older SX-100's require a 240 volt adapter (MITL part number 9105-047-000-NA), while newer systems require factory strapping. In addition, either ACD has the ability to run from a -48 Vdc source or reserve battery pack (see also Reserve Power Supply).

Conditions

- All input voltages must be regulated to within 10%.

Programming

None

Operation

None

Printer and Recording Devices

Description

The system may output data to a printer or recording device. This allows the hotel supervisor to print information (such as the number of local call units charged to a hotel room). An installer may write customer data to a storage device like a cassette tape for backup. See Automatic Wake-Up (Alarm Call), Message Register Print, Room Audit and Traffic Measurement, Customer Data Dump & Load and Customer Data Print.

Conditions

- The printer must meet EIA RS232 requirements.
- The printer must have a minimum line length of 80 characters.
- The printer must be capable of either 300 or 1200 baud, odd, even or no parity, full duplex.
- The system can also operate into a modem for remote transmission.

Programming

- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.
- If "purge or ignore output" is to be used, select System Option 311 (Ignore Print Enable).
- If additional time is required for the carriage return on the printer incorporated, select System Option 313 (Printer Carriage Return Delay).
- Select System Option 118 (Supervisor Printer Control Enable).

Operation

From the console:

To suspend the output (for example, to change paper):

- Dial *14*.
- Press the RELEASE button.

To re-enable the output:

- Dial *14#.
- Press the RELEASE button.

To purge and ignore the output (if the printer is out of service):

- Dial *1400.
- Press the RELEASE button.

Warning:
If the printer is out of service (*1400) some printouts may be lost.

Printer Transmit Additional Nulls

Description

This system option is used to allow flexibility in the transmission of data to different types of printer.

Conditions

None

Programming

Select System Option 315 (Printer Transmit Additional Nulls).

Operation

None

Printout Extra Line Feeds (Hotel/Motel Only)

Description

Where circumstances require it, the printer can be instructed, by means of this system option, to provide additional line feeds, thus leaving extra space between the individual lines of print. Individual blocks of data may thus be more easily separated for distribution.

Conditions

This option may only be used as part of the hotel/motel configuration.

Programming

Select System Option 314 (Printouts Extra Line Feeds, Hotel/Motel Only).

Operation

None

Privacy Disable

Description

This COS Option if selected enables a SUPERSET with a key line appearance of another set to barge in on the conversation.

Conditions

The SUPERSET must have a key line appearance of the set in order to barge in.

Programming

Select COS Option 120 (Privacy Disable).

Operation

- Lift handset.
- Select line.

Programming Security

Description

This feature allows installation or maintenance staff to program a system without changing the switches on the Tone Control card. To safeguard against misuse, a 2- to 4-digit security code may be used to enter Programming.

Conditions

- The Security Code cannot conflict with the numbering plan.
- The RAM memory cannot be initialized unless the switches on the Tone Control card are set to 7776 and the System is idle. This must be set for the system on site.
- The switches on the Tone Control card must be left in a configuration YYXY, where: Y = any digit 0-9, and X is any digit except 7.

Programming

- Assign a 2- to 4-digit access code to Feature Number 29 (Security Code).
- The switches on the Tone Control card must not be set to 776X (where X is the console number).

Operation

To enter the Programming mode:

- Dial the 2- to 4-digit security code.
- Perform standard programming.

To enter Extended Programming Mode:

- Press the NEXT button.
- Perform extended programming.

To exit Extended Programming Mode:

- Press NEXT button.

To exit Standard Programming Mode:

- Press LAMP TEST button.

Range Programming

Description

This feature allows Range Programming of extensions in blocks in the SX-100 or SX-200. By entering a range of equipment numbers, one may assign extension numbers, busy lamp numbers, toll deny status, a Class of Service, or a pickup group to a selected range of equipment numbers. The start extension number, busy lamp number COS number or pickup group number is supplied. The extensions and busy lamps are assigned sequentially starting at the entered value, and the COS number, pickup group and toll denial are assigned to the entire group. As in regular extension programming, any or all of the extension attributes may be assigned at once, terminating with the ENTER key. All the usual defaults for extensions (such as COS #1) apply in Range Programming as well.

Conditions

- Extension numbers in each range must be in numerical ascending sequence, with each being of the same digit length; e.g. the sequence cannot contain ----, 999, 1000, ----.
- Characters * and # cannot be digits in any of the sequence numbers.

Programming

- System Option 212 (Range Programming Enable) must be set.
- See Section MITL9105/9110-090-210-NA, System Programming for full details of programming.

Operation

None

Receive Only

Description

An extension with this COS option may receive calls but cannot originate calls. The extension may, however, originate calls and select features specified in its COS after having received a call, and placing the call on hold by flashing. If System Option 136 (Intercept to Sup.-Illegal Access) is selected, when the extension goes off-hook to dial, it will be forwarded to the supervisor.

Conditions

- If used in conjunction with the Flash Disable feature, ALL types of call origination are blocked.
- See Never a Forwardee and Callback features.
- COS Option Number 45 (Receive Only) and COS Option Number 58 (Contact Monitor) are mutually exclusive.
- If the station is programmed as hands-free, it will go to the idle hands-free mode when it goes off-hook.

Programming

- The extension's COS must include Option Number 45 (Receive Only).

Operation

None

Receiver Busy-Out

Description

This feature allows a particular receiver circuit to be busied out or debusied for maintenance purposes (i.e. pinpointing faulty receiver circuitry). The receiver circuit may be busied out from the test line or from any console.

Conditions

None

Programming

- An access code must be assigned to Feature Number 19 (Maintenance Function).

Operation

(Where 555 is the Maintenance Function Code.)

To busy out a receiver circuit:

- Dial 5553.
- Dial equipment number of the receiver circuit.
- Press RELEASE.

To debusy a receiver circuit:

- Dial 5554.
- Dial the equipment number of the receiver circuit.
- Press RELEASE.

For information of equipment numbering of receiver circuits, see Section MITL9105/9110-090-500-NA, General Maintenance Information.

Receiver Direct Selection

Description

For maintenance purposes a specific receiver may be selected and tested from the test line.

Conditions

- The receiver must be idle.

Programming

- Assign an access code to Feature Number 19 (Maintenance Function).

Operation

At the Tone Control card:

- Set the top two thumbwheel switches to the desired receiver circuit number. Set the two bottom switches to the desired speech path. If the bottom two switches are set to 99, any free speech path will be selected.

At the test line:

- When the test line goes off-hook, it will seize the selected receiver and speech path.

See Receiver Busy-Out and Section MITL9105/9110-090-500-NA, General Maintenance Information.

Recorded Announcements

Description

The SX-100/200 ACD Systems support two different recording units; Recorded Announcement Cards and Recorded Announcement Devices. These devices provide the following characteristics:

- Recorded Announcement Card (RAC). This card occupies one peripheral slot in the system and provides two different 8 second recordings using digital solid state storage. Messages are recorded from the supervisor's console. A single message of 16 seconds may be stored on the RAC.

- Recorded Announcement Devices (RADs). These customer provided tape recording devices connect to the system using a standard Tip/Ring pair of a regular line circuit.

Conditions

Either a RAC or a RAD must be provided.

Programming

See Sections MITL9105/9110-090-222-NA Automatic Call Distribution and MITL9105/9110-090-315-NA Supervisor Console Description.

Operation

None

Remote Maintenance Administration and Test System (RMATS)

Description

The RMAT System allows personnel at maintenance centres to remotely access an SX-100 or SX-200 ACD system. This access allows the maintenance centre to obtain data information relating to maintenance aspects, or to cause programming changes. The system provides a means of remotely identifying ACD alarm conditions. It also allows programming changes to be done, without the necessity of visiting the user's premises. For further information see Section MITL9105/ 9110-98-101-NA and 9105/9110-98-301-NA.

Remote System Reset – Protection Override

Description

This system option allows the ACD system to be reset from the test line or console without setting the thumbwheel switches on the Tone Control card to YYXY (see also Reset the System).

Conditions

None

Programming

- Select System Option 166 (Remote System Reset – Protection Override).
- An access code (i.e. 555) must be assigned to Feature Number 19 (Maintenance Function).
- The thumbwheel switches on the Tone Control card must be set to YYXY, where: Y is any digit 0 to 9, and X is any digit except 7.

Operation

(Where 555 is the Maintenance Function Access code).

- The console or test line dials 555 + 6 = system resets.

Reserve Power Supply

Description

The SX-100/SX-200 ACD's may be optionally equipped with a Reserve Power Supply. The supply is capable of sustaining normal operation in the event of a commercial power failure for a minimum of 2 hours. The SX-200 reserve power supply is mounted in the bottom of the equipment cabinet. The SX-100 reserve power supply is mounted in a separate pedestal designed to support the SX-100. For further information as to the installation of the Reserve Power Supply see Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation, and for ordering information Section MITL9105/9110-090-150-NA, Physical Description and Ordering Information.

Conditions

None

Programming

None

Operation

None

Reset the System

Description

This feature allows the console or test line to reset the system (see also Remote System Reset - Protection Override).

Conditions

- The thumbwheel switches on the Tone Control card must be set to YYXY, where Y is any digit 0 to 9 and X is any digit except 7. This is not necessary if System Option 166 (Remote System Reset - Protection Override) has been selected.

Programming

- Assign an access code (i.e. 555) to Feature Number 19 (Maintenance Function).

Operation

(Where 555 is the Maintenance Function)

From the console or test line:

- Dial 555 + 6 - System reset.

Note: All Traffic Measurement (for the hour), SMDR (in buffers), Call-backs, Call Forwarding, Time, and Date will be lost.

Ringing Time-out 1 Minute

Description

If required, the ringing time-out can be reduced from the default figure of 5 minutes to 1 minute by invoking this system option. At the end of the 1 minute ringing period the call is dropped.

Conditions

None

Programming

Select System Option 167 (Ringing Time-out 1 Minute).

Operation

None

Room Status Audit

Description

This feature allows the supervisor to request a printout that will show the room status of all rooms. The format of this printout is:

First Line:

-- -- -- -- -- mm/dd--hh:mmp-- -- -- ROOM-- - -- STATUS

Subsequent Lines:

rrrr---sn-- -- -- -- (repeated in turn for other extensions to a maximum of five entries per line).

Where:

rrrr is the extension number (room number)

s is the room status (see Room Status Update codes)

n is printed as * if the room is not ready. It will be blank if the room is ready.

Conditions

- See Printer and Recording Devices, Room Status Update (Maid In Room) and Maid in Room.
- System Option 300 (Traffic Measurement Polling) and System Option 317 (Room Status Audit Enable) are mutually exclusive.

Programming

- Class-of-Service Option Number 80 (Room Status Applies) must be included in COS of all extensions to be monitored.
- Select System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable).
- An access code must be assigned to Feature Number 28 (Room Status Update (Maid in Room)).
- System Option 113 (GUEST ROOM Button Enable) must be enabled.
- Select System Option 317 (Room Status Audit Enable).

Operation

- Dial *18.
- Press the RELEASE button – the printer will commence to print the Room Status Audit report.

Room Status Update (Maid in Room)

Description

This feature allows the Hotel/Motel supervisor to monitor, display and change the status of a room. The functions which may be monitored are:

- Room Condition – Vacant and Clean (Status code 1), Occupied and Clean (Status code 2), Vacant and Needs Cleaning (Status code 3), and Occupied and Needs Cleaning (Status code 4).
- Location of the maids is displayed as a period (.) after the Room Status code – i.e. each room the maid is in will have a period after.

Conditions

- Trunk group access will be restricted in the Room Status 1 and 3 if System Option 258 (Controlled Outgoing Restriction Setup) has been selected.
- A Busy Lamp must be assigned to an extension for Room Status to be displayed.
- Room Restrict Button becomes Room Status Button when Room Status is in use.

The following features are mutually exclusive:

- NIGHT 2 facility and Room Status Display.
- GUEST ROOM Button Enable and Supervisor Serial Call.
- Room Status and Supervisor Serial Call.

Programming

- System Option 258 (Controlled Outgoing Restriction Setup) may be selected.
- System Option 113 (GUEST ROOM Button Enable) must be enabled.
- System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable) must be enabled.
- The COS of the extension must include COS Option 80 (Room Status Applies).
- An access code must be assigned to Feature Number 28 ((Room Status Update) Maid in Room) for updating of the room status by the extensions.

Operation

To display the status of an individual room:

- Press the GUEST ROOM button.
- Dial the required extension number – console displays the complete room status. See GUEST ROOM Button.

To display all rooms with the same status:

- Press the ROOM STATUS button.
- Press and hold down selected room status code digit.
  0 – Busy Lamp Field shows all rooms that the maids are in.
  1 – Busy Lamp Field shows all vacant and clean rooms.
  2 – Busy Lamp Field shows all occupied and clean rooms.
  3 – Busy Lamp Field shows all vacant rooms that need cleaning.
  4 – Busy Lamp Field shows all occupied rooms that need cleaning.
- The source display shows the number of rooms of the requested status.
- Press the RELEASE button.

To change the status of a room:

- Press the GUEST ROOM button.
- Dial the required extension number (not required if talking to the room) – the console displays the status of the room.
- Dial the new Room Status code.
- DESTINATION display changes to show the new status code.
- Press the RELEASE button.

To change all rooms with Status 2 (Occupied and Clean) to Status 4 (Occupied and Needs Cleaning):

- Dial *10*.
- Press the RELEASE button.

To change all rooms with Status 4 (Occupied and Needs Cleaning) to Status 2 (Occupied and Clean):

- Dial *10#.
- Press the RELEASE button.

See also the Maid In Room feature description.

Serial Call Override Flash Button Enable

Description

Ths System Option allows both the GUEST ROOM button and the SERIAL CALL button to be used on the same console. This is done by programming the system to treat the FLASH button as the SERIAL CALL button.

Conditions

- The FLASH button and the SERIAL CALL button are mutually exclusive if this option is enabled.

Programming

- Select System Option 121 (Supervisor Serial Call Override FLASH Button Enable).

Operation

- See Serial Call but use the FLASH button as the SERIAL CALL button.

Single Digit Dialing

Description

This feature allows selected features, such as hunt groups, trunk groups or extensions, to be accessed by dialing a single digit number even though it conflicts with the system numbering plan. When programming the system, the access code or extension number is entered as N#, where N is any single digit number. The # character is assigned an interdigit time-out period. If an extension dials a digit and does not dial a second digit within the time-out period, the system assumes that the # character was dialed and completes the call. The # character may be dialed from an extension in place of waiting for the time-out period.

Conditions

- To access a single digit service from the supervisor console, N# must be dialed.
- Features requiring an extension number to be dialed after dialing the feature access code, may not be accessed by single digit dialing.

Programming

- Assign access code or extension number as N#, where N is any single digit number.
- System Option 213 (Single Digit Dialing Enable) must be selected.
- For an interdigit time of 3 seconds, select System Option 214 (Single Digit Dialing Time-Out = 3 seconds); if the interdigit time-out period is to be 5 seconds, select System Option 215. (Single Digit Dialing Time-Out = 5 seconds). If neither of these options are selected, the interdigit time-out is 4 seconds.

Operation

From an extension:

- Dial the required single digit, wait the time-out period or dial # – the call is completed.

From the supervisor console:

- Dial N#, where N is the single digit number – the call is completed.

SMDR Overwrite Enable

Description

Selection of this System Option ensures that a caller has access to a trunk, even if all 45 SMDR buffers are full or waiting to be printed. A buffer that is waiting to be printed will be overwritten.

Conditions

None

Programming

Select System Option 285 (SMDR Overwrite Enable).

Operation

None

Special DISA

Description

This COS Option enables a DISA trunk call to dial an Account Code without having previously dialed the DISA Access Code. This permits the use of Multiple DISA Access Codes by using different Account Code.

Conditions

The incoming trunk must be a DISA trunk.

Programming

Select COS Option 110 (Special DISA).

Operation

To access the system:

- Dial the required directory number from a DTMF telephone.
- The system returns two bursts of ringback tone followed by dial tone.
- Dial the Access Code - ACD system dial tone is returned.

Speech Path Busy-Out

Description

This feature allows a particular speech path circuit to be busied out, or be put in service again.

Conditions

None

Programming

- An access code must be assigned to Feature Number 19 (Maintenance Function).

Operation

(Where 555 is the Maintenance Function Access code.)

From the console or test line:

To busy out a speech path:

- Dial 555 + 33 + the speech path number (01-31) - speech path busied out.
- Press the RELEASE button.

To debusy a speech path:

- Dial 555 + 43 + speech path number (01-31) - speech path debusied.
- Press the RELEASE button.

Speech Path - Direct Selection

Description

The status of a speech path and/or a receiver may be displayed on the scanner card. This may be done from the test line and using the Tone Control card switches to select a receiver and speech path. For further information see Section MITL9105/9110-090-500-NA, General Maintenance Information.

Speed Call

Description

This feature allows extensions to program and use directory numbers in a speed call application. The supervisor may program numbers or may view programmed numbers. Individual extensions may also be assigned personal tables which the extension programs. Number redial (10, 16, 24 digits) is also available on an extension basis. See also Section MITL9174-518-105-NA.

Conditions

None

Programming

- See Section MITL9105/9110-090-220-NA, Speed Call for full details.

Operation

- See Section MITL9105/9110-090-220-NA, Speed Call for full details.

Station Conference

Description

This feature allows an extension user to set up a conference with up to six conferees (plus the originating extension), without the assistance of the supervisor. The conferees may be any combination of extensions and trunks. To originate a conference, an extension user first establishes a 2-party call, then adds-on the remaining conferees. Any extension in the conference with an appropriate COS may add additional parties to the conference to a maximum of seven. If the originator encounters a busy or unanswered extension number, he may flash the switchhook to return to the conference. If after flashing out of the conference, the extension hangs up, the extension will automatically be recalled to the conference. If a CO trunk is to be added to the conference and the number dialed is incorrect or unanswered, the calling party must hang up to release the connection. The extension will automatically be recalled to the conference.

Conditions

- COS Option Number 49 (Station Conference) is mutually exclusive with COS Option Numbers 48 (Broker's Call) and 98 (Transfer with Privacy).
- If a conference contains only trunks (i.e. all stations in the conference hang up), it is possible to leave two trunks in the conference alone but one must be a Non-CO trunk.
- A call may not be held or transfered by an extension in a conference.
- A maximum of 30 conferences may be active at one time.
- Only one party may flash out of the conference at a time.
- Hands-free stations may be conferees, but must have normal station(s) present as conferees, otherwise the hands-free stations will return to their idle mode.

Programming

- The originating extension must have Option Number 49 (Station Conference) in its COS.
- System Options 181 (Can Flash if Talking to an Incoming Trunk), 182 (Can Flash if Talking to an Outgoing Trunk), 180 (Can Flash if Talking to an Extension), 183 (Cannot Dial a Trunk after Flashing) and 184 (Cannot Dial a Trunk after Flashing if Holding or in Conference with a Trunk) may be used to modify the conference capability of extensions.

Operation

To establish a conference:

- Establish a 2-party call.
- Flash the switchhook - transfer dial tone is returned (if programmed).

- Dial the number of the next conferee – ringing tone is returned. When the conferee answers, flash the switchhook. Three-party conference exists.
- Any extension in the conference may add additional conferees to the conference by repeating the above two steps.

Station Message Detail Recording (SMDR)

Description

Station Message Detail Recording (SMDR) allows data to be collected for each outgoing and, optionally, incoming trunk call. This data may be output to a printer or recording device (see Printer and Recording Devices). This data includes:

- Records of outgoing and/or incoming calls.
- Records of up to 26 digits dialed on the trunk.
- Account codes of up to 12 digits.
- Optional meter pulses.
- Outgoing trunk number.
- Optional system ID.
- Long calls identifications.
- Time to answer for incoming calls.
- Identifies other extensions in a transfer.
- Identifies conferences and transfers.
- Records answer supervisions.
- Identifies speed call originated calls.

Conditions

None

Programming

- See Section MITL9105/9110-090-451-NA, Station Message Detail Recording, for full details.

Operation

- See Section MITL9105/9110-090-451-NA, Station Message Detail Recording, for full details.
- If the printer is suspended (*14*) for an extended period of time, a minor alarm will be raised. The DESTINATION display will show E098 and the SOURCE display Prntr. The printer may be restarted by dialing *14#. The alarm may be cancelled by dialing *8#.

Station Override Security

Description

This option provides an extension with security against Executive Busy Override (see Executive Busy Override).

Conditions

None

Programming

- The COS of the extension must contain Option Number 42 (Station Override Security).

Operation

None

Station Transfer Consultation Hold/Add-On

Description

This feature allows an extension user on an established call to hold the call, add a third party to the call, or transfer the original call to a third party. By programming selected options, the feature may be restricted on the basis of the type of the second party in the call.

Conditions

- This feature is mutually exclusive with COS Option Number 48 (Broker's Call), COS Option Number 62 (Flash for Supervisor) and COS Option Number 46 (Flash Disable).
- The number of the third party in the call must not be the Dial Call Pickup or Directed Call Pickup access codes. All other types of call may be made after holding the second party (subject to system and extension options).
- Calls may not be transferred to the paging circuit.
- Flashing the switchhook while talking to the supervisor will result in release of the call.

Programming

- To allow an extension to hold, add-on, or transfer a call in which the second party is an extension, select System Option 180 (Can Flash if Talking to an Extension).
- To allow an extension to hold, add-on, or transfer a call in which the second party is an outgoing trunk, select System Option 182 (Can Flash if Talking to an Outgoing Trunk).
- To allow an extension to hold, add-on, or transfer a call in which the second party is an incoming trunk, select System Option 181 (Can Flash if Talking to an Incoming Trunk).
- To prevent an extension from attempting to hold a trunk call, then originating a second trunk call, select System Option 184 (Cannot Dial a Trunk after Flashing if Holding or in Conference with a Trunk).
- To prevent an extension from holding an extension call, then originating a trunk call, select System Option 183 (Cannot Dial a Trunk after Flashing).
- If a combination of the above is selected, calls may be held, added or transferred as specified by the combination selected.
- If System Option 220 (Transfer Dial Tone) is selected, transfer dial tone is returned.
- COS option 49 (Station Conference) must be enable to allow calls to be added to the conference.

Operation

On an established call:

- Flash the switchhook – dial tone is returned, the caller is held and will hear music if provided.
- Dial the number of the required extension – ringing tone or busy tone is returned.
- After the called party answers – private conversation with third party.
- Flash the switchhook – a 3-party call is established.
- Replace the handset – the held call is transferred to the called extension.
- After the called extension replaces the handset – the call is released.

Station Transfer Security

Description

This feature is designed to prevent "lost" calls (i.e. mishandled calls). If a trunk call is transferred to a ringing extension, and the extension does not answer within the time-out period, this feature will route the call to the supervisor during Day Service, or to the extension that originally answered the call during Night Service. Also, if an extension during transfer, hangs up before completing dialing, the call which was held (by the original extension flashing) automatically calls back the extension.

Conditions

- Timed Recall applies only to trunk calls.

Programming

- If the recall time-out is 10 s, select System Option 125 (Supervisor-Timed Recall - Don't Answer 10 s).
- If the recall time-out is 20 s, select System Option 126 (Supervisor-Timed Recall - Don't Answer 20 s).
- If the recall time-out is 30 s, no System Option is selected.
- If the time-out is 40 s, select System Option 127 (Supervisor-Timed Recall - Don't Answer 40 s).

Operation

None

Store and Forward

Description

This System Option enables all dialed digits to be collected before a trunk is seized. This eliminates double digits from appearing on SMDR records where an ESS CO is used. The two ARS Dial 0 Timeout System Options apply to Store and Forward.

Conditions

None

Programming

- Select System Option 171 (Store and Forward).
- Select System Option 240 (ARS Dial 0 Timeout 5 Seconds) or
- Select System Option 241 (ARS Dial 0 Timeout 10 Seconds) to enable the ACD system to differentiate between Dial "0" calls and long distance Dial "0" calls.

Operation

None

SUPERSETs

Description

The SX-100/200 ACD systems can support up to 64 SUPERSET 3 and SUPERSET 4 electronic telephone sets.

The SUPERSET 3 can have up to 14 Speed Call numbers and one line appearance (Prime Line). The set can alternately have up to 3 line appearances (including Prime Line) and 12 Speed Call numbers. In addition to these 15 buttons, there is one red hold button which may be used to put calls on hold or retrieve them from hold. For further information consult the following MITEL practices:

- Section MITL9105/9110-090-100-NA, General Description
- Section MITL9105/9110-090-106-NA, Features and Services Description
- Section MITL 9105/9110-090-200-NA, Shipping, Receiving and Installation
- Section MITL9105/9110-090-320-NA, Extension Test Procedures.

The SUPERSET 4 incorporates a Liquid Crystal Display (LCD) for line status indication, user prompting and displays such as message waiting, time and date. Each set has a total of 15 buttons which may be used for line appearances or Speed Call numbers. In additon to these 15 buttons, there is one red hold button which may be used to put calls on hold or retreive them from hold. For further information consult the following MITEL practices:

- Section MITL9105/9110-090-100-NA, General Description
- Section MITL9105/9110-090-107-NA, Features and Services Description
- Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation
- Section MITL9105/9110-090-320-NA, Extension Test Procedures.

SUPERSET Disconnect Alarm

Description

In the event of a SUPERSET being disconnected, a minor alarm is raised if this system option is enabled. The alarm is displayed in the normal manner at the supervisor console, and, if cancelled by the supervisor, does not recur, even though the set may not have been reconnected. This prevents the alarm, once having been recognized, from masking subsequent alarms.

Conditions

- Effective only where SUPERSET lines are installed.

Programming

- Select System Option 330 (SUPERSET Disconnect Alarm).

Operation

None

SUPERSET Immediate Line Selection Enable

Description

Enabling of this system option causes the SUPERSET to go off-hook and select the prime line immediately after any key on the keypad is pressed. If the prime line is busy, the personal outgoing line (if provided) is selected.

Conditions

- This feature may be utilized by SUPERSET extensions only.

Programming

- Select System Option 331 (SUPERSET Immediate Line Selection Enable).

Operation

If selection of the prime line is required (or the personal outgoing line if the prime line is busy), it is not necessary to lift off the handset or operate the 'speaker on' key in order to go off-hook. This is accomplished automatically when the first digit of the desired number is dialed.

SUPERSET Last Number Redial Enable

Description

Enabling this system option activates the SUPERSET Last Number Redial feature. This feature provides for the automatic storage of the last number dialed, and its redial by pressing the appropriate key.

Conditions

- Applies only to SUPERSET extensions.

Programming

- Select System Option 332 (SUPERSET Last Number Redial Enable).

Operation

To redial the last number dialed press the 'redial' key. The last number dialed will be redialed automatically.

SUPERSET 4 Sub-Supervisor

Description

This Class-of-Service Option allows a SUPERSET 4 to be used as a supervisor position for recalls. If a call incoming via a trunk is received at a SUPERSET 4, and subsequently transferred to another extension, it will recall to the SUPERSET 4 extension and not to the supervisor console under recall conditions. If the SUPERSET 4 is busy on another call at the time of recall, a 'new call tone' of 0.5 second burst of ringing is received. The 'new call tone' is not heard if the SUPERSET 4 user is using the speaker system.

The SUPERSET 4 Sub-Supervisor can send a message to a station or SUPERSET. If a message lamp exists, it will flash to indicate that a message is waiting. If a message waiting bell exists, it will give three 125 ms bursts. When a Sub-Supervisor dials a station or SUPERSET, and a message already exists between the two parties, the "MSG" prompt will be ON. If the Sub-Supervisor presses the "MSG" key the message key will be cancelled.

Conditions

This feature is applicable only to SUPERSET 4 extensions.

- Messages set up by a SUPERSET 4 Sub-Supervisor are not indicated on the busy lamp display of the console, but printer data is supplied. Should a station with a message waiting call the supervisor, the console's MSG WAITING LED would be lit even though the message was sent from a SUPERSET 4 Sub-Supervisor.
- A message set up on a station or SUPERSET is automatically cancelled when that set calls and is answered by ANY SUPERSET 4 Sub-Supervisor.

Programming

Select Class-of-Service Option 106 (SUPERSET 4 Sub-Supervisor).

Operation

None

Supervisor Automatic Callback Cancel

Description

The supervisor may cancel all system callbacks from the console.

Programming

Assign an access code to Feature Number 18 (Supervisor Function), usually as indicated under Operation.

Operation

Dial ⁎4.

- Dial #.
- Press the RELEASE button – all callbacks are cancelled.

Supervisor Bell Off

Description

Selection of this option activates the supervisor console BELL OFF button. Pressing the button turns off the console tone ringer; incoming calls are identified by flashing LED's only. Pressing the BELL OFF button again enables the console bell.

Conditions

None

Programming

- Select System Option 100 (Supervisor Bell Off Button Enable).

Operation

To disable the console tone ringer:

- Press the BELL OFF button – BELL OFF lamp is lit.

To enable the console tone ringer:

- Press the BELL OFF button – BELL OFF lamp is dark.

Supervisor Busy Override

Description

This option allows the supervisor who encounters a busy connection, to override the connection and enter the call. Before the supervisor enters the connection, all parties in the call hear an 800 ms burst of warning tone, after which the supervisor is connected to the call and the warning tone continues for a further 200 ms. A single 200 ms burst of warning tone is repeated every 6 seconds for the duration of the override. If the call cannot be overriden, reorder tone is returned.

Conditions

- If a call includes an extension with Option Number 41 (Data Security) in its COS, no party in the call can be overridden.
- Override can only be performed on an established (talking) call.
- Override cannot be performed on an attempted trunk group access.
- A call cannot be overriden by two parties simultaneously.

Programming

- Select System Option 103 (Supervisor Busy Override).

Operation

Having reached a busy number:

- Press and hold down the console OVERRIDE button – all parties in the connection hear the warning tone, you are connected to the call.
- Release the OVERRIDE button – you are released from the call.

Supervisor Button Change Flash to Monitor

Description

This System Option enables the Flash key on the console to be changed to a Monitor key. The key when pressed and held down enables the supervisor to monitor an Agent without generating an intrusion tone. To inhibit audio from the supervisor the console must have a special handset with a microphone switch.

This option also enables the supervisor to provide assistance when a Agent needs help. The Agent using can signal to the supervisor help is needed by pressing the SUPERSET 4 HELP key. The console will alert the supervisor with a minor alarm.

Conditions

System Options 121 (Supervisor Button Change Flash to Serial Call), 131 (Supervisor Button Change Flash to Monitor and Supervisor Console Flash Key are mutually exclusive.

Programming

Select System Option 131 (Supervisor Button Change Flash to Monitor).

Operation

To Monitor a conversation.

From the Console:

- Dial the extension number – busy tone is returned.
- Press and hold down the Flash key – you are connected to the call.

To respond to an Agent needing help.

- A minor alarm is given by the console – Press the Alarm Reset key.
- Agent's number will appear on the display???
- Dial the Agent's number – Press and hold down the Flash key.

Supervisor Button Change Flash to Serial Call

Description

The System Option allows both the GUEST ROOM button and the SERIAL CALL button to be used on the same console. This is done by programming the system to treat the FLASH button as the SERIAL CALL button.

Conditions

The FLASH button and the SERIAL CALL button are mutually exclusive if this option is enabled.

Programming

Select System Option 121 (Supervisor Button Change Flash to Serial Call).

Operation

See Supervisor Serial Call but use the FLASH button as the SERIAL CALL button.

Supervisor Call Forward Setup and Cancel

Description

This feature allows the supervisor to set up, review and cancel call forwarding for any extension. (The extension for which the supervisor sets up forwarding need not have any of the call forwarding features in its COS.) The supervisor may also set up call forwarding from the extension to the supervisor.

Conditions

- The extension to which the calls are forwarded must not have Option Number 38 (Never a Forwardee) in its COS.
- The supervisor can only set up a forwarding type for which a feature access code has previously been assigned (features 3, 4, 5 and 46).
- It is not possible to set up or cancel call forwarding for an extension whose number begins with #.
- Assign an access code to Feature 18 (Supervisor Function) usually * as shown under Operation.

Programming

None

Operation

To set up Call Forwarding (to internal number):

- Dial *11 followed by the number of the forwarding extension.
- Dial the Call Forwarding type digit:
  1 = Call Forwarding – Busy
  2 = Call Forwarding – Don't Answer
  3 = Call Forwarding – Follow Me
  4 = Call Forwarding – Busy/Don't Answer
- Dial the number of the extension to which the calls are to be forwarded, or the access code of the supervisor (Feature Number 1) if the call is to be forwarded to the supervisor.
- Press the RELEASE button.

To set up Call Forwarding (to external number):

- Dial *11, followed by number of forwarding party (see note).
- Dial the Call Forwarding type digit:
  1 = Call Forwarding – Busy
  2 = Call Forwarding – Don't Answer
  3 = Call Forwarding – Follow Me
  4 = Call Forwarding – Busy/Don't Answer.
- Dial the Speed Call Feature Access Code.

- Dial the Speed Call Table number for the particular external party required.
- Press the RELEASE button.

Note: If an external Call Forwarding number has already been set up for a forwarding extension, then the supervisor will see the letters ECF on the DESTINATION display, after dialing *11 plus the forwarding extension number.

To review Call Forwarding for an extension:

- Dial *11 followed by the number of the extension.
  - The console SOURCE display shows the extension number dialed, followed by the call forwarding type. The DESTINATION display shows the extension number to which the calls are to be forwarded.
- Press the RELEASE button.

To cancel Call Forwarding for a single extension:

- Dial *11 followed by the extension number.
- Dial #.
- Press the RELEASE button.

To cancel Call Forwarding for all extensions:

- Dial *11.
- Dial #.
- Press the RELEASE button.

Supervisor Callback Cancel

Description

The supervisor may cancel all system callbacks from the console.

Conditions

None

Programming

- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

- Dial *4.
- Dial #.
- Press the RELEASE button – all callbacks are cancelled.

Supervisor-Called Number Display

Description

If the supervisor dials an extension or individual trunk access code, that number will appear in the first one to four segments of the DESTINATION display. The Class of Service of the extension will appear in the last segment of the DESTINATION display. The ATT LED in the DESTINATION display will light. If the extension or trunk is busy, the BUSY LED will light. If the extension is available, the RING LED will light. If an invalid number is dialed, the ERR lamp will be lit in the DESTINATION display.

Conditions

None

Programming

- Complete all system programming as per VOLUME 3.

Operation

None

Supervisor Calling Number Display

Description

A trunk or extension that calls to the supervisor will have its number displayed. This will appear in the first one to four segments of the SOURCE display when the ANSWER button is pressed. The Class of Service will be displayed in the last segment of the SOURCE display. The ATT LED in the SOURCE will light.

Conditions

None

Programming

- Complete all programming as per VOLUME 3.

Operation

None

Supervisor Calls Waiting Indicator

Description

The supervisor may have queued calls that are directed to the console (outside trunks and ACD extensions). The total number of calls in the queue will be displayed in the CW (Call Waiting) display. The console tone ringer will ring and one or more of the call LED's will flash (Dial 0, LDN 1, 2, 3 or 4) with the ANSWER LED.

Conditions

None

Programming

None

Operation

None

Supervisor Camp-On with Indication

Description

This feature allows the supervisor to connect calls to busy extensions or trunks for automatic completion when the busy party becomes free.

When a call is camped-on to an extension, the called extension, and only that extension, will hear a burst of Camp-On tone indicating the existence of a Camped-On call. If the Camped-On call is a trunk, two bursts of Camp-On tone are given. If the Camped-On call is an extension, a single burst of tone is given.

Calls that are not completed within the camp-on time-out will recall to the console.

If Music on Hold is provided, the camped-on party will hear music until the called party answers or the call recalls to the console.

Conditions

- If System Option 106 (Supervisor Camp-On) is not selected, an attempt to camp-on a call to a busy number will result in the call being released when the console RELEASE button is pressed.
- Extensions with COS Option Number 41 (Data Security) selected may have a call camped-on, but the extension will not receive the Camp-On tone.
- If the called party is on hold when the Camp-On is initiated, and Music on Hold is provided, the music is removed while the Camp-On tone is applied.

Programming

- Select System Option 106 (Supervisor Camp-On).
- If System Option 123 (Supervisor Timed Recall - Camp-On - 20 s) is selected, the recall time is 20 seconds.
- If System Option 124 (Supervisor Timed Recall - Camp-On - 40 s) is selected, the recall time is 40 seconds.
- If neither System Option 123 nor 124 is selected, the recall time is 30 seconds.

Operation

To Camp-On a call to a busy number:

- The number you have called is busy.
- Press the RELEASE button - this automatically camps on the calling party to the busy number.

Supervisor CCSA Access

Description

The supervisor may access the common controlled switching arrangement trunks. These trunks are similar to DID trunks in all respects, except that they are considered to be Non-CO and may be used as bothway trunks. For further information see Direct Trunk Access and CCSA.

Supervisor Class-of- Service Display

Description

The supervisor may display the Class of Service of any extension or trunk in the system. The Class of Service will appear in the last two segments of the SOURCE or DESTINATION displays over the title of CLASS. For further information see Class of Service.

Conditions

None

Programming

- Complete all programming as per VOLUME 3.

Operation

None

Supervisor CO Trunk – CO Trunk Connect Enable

Description

Selection of this option allows the supervisor to connect a CO trunk call to another CO trunk, then release the call from the console. See End-of-Dial Signal for Outgoing Trunks.

Conditions

- Two or more trunks may be connected in a Supervisor-Controlled Conference.
- At least one of the trunks in the connection must provide release supervision or the trunk connection will not automatically release from the system when the call is completed. (Note that you cannot connect two loop start trunks.)

Programming

- Select System Option 107 (Supervisor CO Trunk – CO Trunk Connect Enable).
- System Option 107 may be selected in conjunction with System Options 108 (Supervisor CO Trunk – Non-CO Trunk Connect Enable) and 109 (Supervisor Non-CO Trunk – Non-CO Trunk Connect Enable).

Operation

After answering an incoming trunk call, or establishing an outgoing trunk call:

- Dial the trunk group access code of the required outgoing CO trunk.
- Dial the required CO number.
- Wait for the called party to answer.
- Press the RELEASE button – the two trunks are connected together.

Supervisor Console Emergency Transfer

Description

If the ACD system goes completely out of service and the MAJ Alarm LED is not on, the EMERGENCY TRANSFER switch may be activated. It is located on the base of the console and may be used to manually set the ACD system into the emergency transfer position.

Conditions

- Operation of the switch will disconnect all existing calls. It may connect up to six trunks for an SX-100 or 12 trunks for an SX-200, to extensions for direct out lines.

Calls on the transfer trunks will not be dropped when the transfer switch is returned to normal. The trunk will be released after the extension goes on-hook.

- Console transfer switch must be enabled on the system's maintenance panel.

Programming

- No programming is required but hardwiring details are discussed in Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation.

Operation

To operate the emergency transfer:

- Set the switch to the Transfer position.

To restore normal operation:

- Set the switch to the Normal position.

Supervisor Console Flash

Description

The supervisor may flash for the long-distance operator by pressing the FLASH button.

Conditions

- The supervisor must be connected to a long-distance trunk that the long-distance operator has assisted with.

Programming

None

Operation

- After answering a supervisor recall, the extension wants to be reconnected to the long-distance operator.
- Press the FLASH button several times.
  - Wait for long-distance operator to answer and advise the operator of the situation.
- Press the RELEASE button.

Supervisor Console Ringer Codes

Description

The latest version supervisor console issues distinctive audible ringer patterns on certain calls to the supervisor, which can be of assistance to a visually impaired supervisor. These ring patterns, repeated each second, are as follows:

- Incoming Call - Standard 0.5 s tone on, 0.5 s tone off
- HOLD 1 Call Time-Out - One 62.5 ms tone
- HOLD 2 Call Time-Out - Two 62.5 ms tones, separated by 48 ms tone off interval
- HOLD 3 Call Time-Out - Three 62.5 ms tones, separated by 48 ms tone off intervals
- HOLD 4 Call Time-Out - Four 62.5 ms tones, separated by 48 ms tone off intervals
- Flash for Supervisor - 250 ms tone on, 83 ms tone off and 250 ms tone on
- Minor Alarm - 62.5 ms tone on, 83 ms tone off and 250 ms tone on.

As each one of the foregoing conditions arises it is queued, with the supervisor being able to test and/or answer the latest call in turn from the queue.

Conditions

- Polling of console buttons (see Operation) must be done with the LAMP TEST button depressed in the silent mode (ringer off, display segments lit).

Programming

None

Operation

Sighted Supervisor Operation

- The console is operated in the usual manner, as outlined in the Console Operating Instructions Manual. The distinctive audible ring sequences are not available with the earlier model console.

Visually Impaired Supervisor Operation

- As incoming calls to the console occur, they are placed in a queue, and only the latest call will cause its distinctive ring pattern to be heard.
- All incoming calls (LDN calls, Dial 0 calls or recalls) as indicated by the standard ring pattern (see Description) may be answered with the ANSWER button.
- Other types of calls may be answered by pressing the appropriate console button corresponding to the audible ring pattern.
- To ascertain the state of individual console buttons (lit, flashing or off), the supervisor presses the LAMP TEST button. While this button is depressed, other buttons can be depressed in turn, and each will indicate its status; i.e. if the associated LED is lit, the ringer will sound as long as the button is depressed, but if the LED is flashing the ringer will give a 0.5 s on/0.5 s off audible sound.

Supervisor-Controlled Conference

Description

This feature allows the supervisor to set up a conference with up to six conferees plus the supervisor. The conferees may be any combination of extensions and trunks. To set up a conference, the supervisor must have a completed Source and/or a Destination call. If only one party is in the conference it will hear music, if provided. Each time the supervisor enters the conference, all parties in the conference hear a warning tone. The supervisor may reenter the conference or be recalled to the conference, by an extension switchhook flash, at any time.

Conditions

- Parties may be added to the conference by the supervisor only.
- If a single tenant is selected, only one conference may be active at a time.
- If two or more trunks are to be connected to the conference, the required trunk-to-trunk parameters must be selected.
- The conference must not contain trunks for which automatic release supervision is not provided.
- If the conference contains only a single party for more than one minute, the party recalls to the supervisor as a RECALL, and the conference is terminated.
- A hands-free station(s) may not be left in a conference without a normal telephone set being in conference.
- Two loop start trunks cannot be in a conference at the same time.
- Two hands-free stations cannot be in a conference at the same time.

Programming

- Select System Option 110 (Supervisor Conference).
- Select the required Trunk-to-Trunk Connect System Options - System Option Numbers 107 (Supervisor CO Trunk - CO Trunk Connect Enable), 108 (Supervisor CO Trunk - Non-CO Trunk Connect Enable), and 109 (Supervisor Non-CO Trunk - Non- CO Trunk Connect Enable).

Operation

After establishing a Source, Destination or both:

- Press the CONF button - the CONF lamp lights, the SOURCE display clears and the DESTINATION display shows C.
- Press the RELEASE button.
- Dial the number of the next party - when the party answers.
- Press the CONF button - you and the called party are connected to the conference.
- Press the RELEASE button - the called party remains in the conference, the console is released and becomes idle.

- Dial the number of the next party. When the party answers, repeat the above two steps.

Supervisor Date Display

Description

The Supervisor Console will display the date if the appropriate console button is depressed. Month and date are initially shown, followed a short time later by the year. The date may be set by dialing the relevant code; it is not necessary to enter the programming mode.

Conditions

Feature Number 18 (Supervisor Function) must be assigned an access code. For the purposes of the following description this will be assumed to be *.

In the event of a power failure, the date is not lost. However, if the power failure extends over midnight it will be necessary to reset the date, since it is incremented by the transition of the clock from p.m. to a.m. (or 23.59 to 00.00). During a power failure the clock does not function.

Date and time may not be displayed simultaneously.

- Some traffic measurements may be lost with a date change.

Programming

None

Operation

To set the date:

- Dial *15.
- Dial in a 2-digit code for the month.
- Dial in a 2-digit code for the date.
- Dial in a 2-digit code for the year.
- Press the RELEASE button – the date is now set.

To see the date:

- Press the IDENT button – the month and date are displayed in place of the time.
- Hold down the IDENT button – after a 5-second delay, the month and date are replaced by the year.
- Release the IDENT button – the time is again displayed.

Supervisor DISA Code Set-up Enable

Description

This option allows the supervisor to change the Direct Inward System Access (DISA) security code that a caller must dial to access the system.

Conditions

- The DISA code cannot conflict with the numbering plan.
- The DISA code is limited to a maximum of four digits.
- The DISA code cannot be displayed.
- A supervisor cannot delete the DISA code; it may only be deleted via Programming.

Programming

- Select System Option 111 (Supervisor DISA Code Set-up Enable).
- Assign an access code to Feature Number 21 (Direct Inward System Access).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

- Dial *7.
- Dial the new 1-, 2-, 3- or 4-digit DISA code.
- If a new code is not entered, the existing code will remain in effect.
- Press the RELEASE button - the new DISA code is in effect.

Supervisor Function

Description

By assigning a code to the Supervisor Function, the Supervisor may access all Supervisor Function codes. For further information see Table 6-3 of Section MITL9105/9110-090-500-NA, General Maintenance Information.

Conditions

None

Programming

- Assign a code to Feature Number 18 (Supervisor Function).

Operation

- See Table 6-3 of Section MITL9105/9110-090-500-NA, General Maintenance Information.

Supervisor Hold Circuits

Description

The supervisor may put an extension or trunk on hold at any one of four HOLD positions. The system may be programmed for a call hold recall of a variable time (see Variable Timers).

Conditions

None

Programming

- For a Call Hold Recall of 20 seconds, select System Option 128 (Supervisor-Timed Recall - Hold - 20 seconds).
- For a Call Hold Recall of 40 seconds, select System Option 129 (Supervisor-Timed Recall - Hold - 40 seconds).
- If neither Options 128 or 129 are selected, the default time is 30 seconds.

Operation

To put a Call on Hold at the console:

- Press the ANSWER button when call rings console.
- Press any HOLD button (1-4), call is put on hold.

To Retrieve a Call on Hold at the console:

- If the call has been recalled by a call hold time-out, the HOLD button LED will flash. Push the button (flashing) to speak with the call "on hold".
- If the call is to be recalled before a time-out, the supervisor may press the HOLD button where the call is being held. By pressing the HOLD button, the call will be transferred to the SOURCE or the DESTINATION if there is a SOURCE already.
- A loop start trunk may not be taken off a hold and released to another loop start trunk.
- A hands-free station may not be taken off a hold and released to another hands-free station.

Supervisor Individual Trunk Access

Description

The supervisor may access an individual trunk to: busy or debusy it, dial out on it, or make a night service assignment.

Conditions

None

Programming

- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

To busy out an Individual Trunk:

- Dial *9.
- Dial individual trunk access number (equipment number).
- Dial *.
- Press the RELEASE button.

To debusy an Individual Trunk:

- Dial *9.
- Dial individual trunk access number (equipment number).
- Dial #.
- Press the RELEASE button.

To access an Individual Trunk:

- Dial *20.
- Dial individual trunk access number (equipment number).
- Dial #.
- Press the RELEASE button.

To make a Flexible Night Service Assignment:

- Dial *3.
- Dial individual trunk access number (equipment number).
- Press the NIGHT 1 or NIGHT 2 button.
- Dial the extension number that will answer the trunk.
- Press the RELEASE button.

Supervisor Jacks

Description

Each supervisor console is equipped with two sets of supervisor jacks. Either set of jacks may be used by the supervisor. The other set provides a monitoring, supervisory or training position. Most commonly used handsets or headsets may be used with the supervisor console. Removal of both handsets and headsets from the console(s) causes the console(s) to become inoperative. If the handsets are removed from both console 1 and console 2, the system will switch to Night Service 1. The presence or absence of a maintenance console does not affect the switching to Night Service.

Conditions

None

Programming

None

Operation

None

Supervisor Lamp Test

Description

The supervisor may test all the console LED's, 7-segment displays and tone ringer on the console by pressing the LAMP TEST button.

Conditions

- If the LAMP TEST button is pressed and the BELL OFF button has been enabled, the console tone ringer will still be rung.

Programming

None

Operation

- Press the LAMP TEST button and hold down.
  - Either the console 7-segment displays will show figure 8's or all console LED's are lit with the ringer sounding. Pressing the LAMP TEST button repeatedly will toggle between the two conditions.

Note: In the latest version console, pressing the LAMP TEST button for more than 5 s will lock the console in this condition until either another button is pressed, or a call arrives at the console.

Supervisor Lockout

Description

The supervisor is in a locked-out condition, after establishing a call from a trunk or station to another trunk or station, and then releasing from the connection. The lockout implies that the supervisor cannot reenter the established speech paths unless one of the parties "flashes" the supervisor.

Conditions

None

Programming

- Class-of-Service Option 41 (Data Security) must be in the extension's COS, to prevent the supervisor from entering the circuit.

Operation

- The supervisor completes the establishment of a call, then releases the console from the connection.

Supervisor Non-CO Trunk - Non-CO Trunk Connect Enable

Description

This option allows the supervisor to connect a Non-CO Trunk call to another Non-CO Trunk, then release the call from the console. See End-of-Dial Signal for Outgoing Trunks.

Conditions

- Two or more trunks may be connected together in a Supervisor-Controlled Conference.
- At least one of the trunks must provide release supervision, or the trunk connection will not automatically release from the system when the call is completed.

Programming

- Select System Option 109 (Supervisor Non-CO Trunk - Non-CO Trunk Connect Enable).
- System Option 109 may be selected in conjunction with System Options 107 (Supervisor CO Trunk - CO Trunk Connect Enable) and 108 (Supervisor CO Trunk - Non-CO Trunk Connect Enable).

Operation

After answering an incoming Non-CO Trunk call, or establishing a Non-CO outgoing trunk call:

- Dial the access code of the required Non-CO Trunk.
- Dial the required number.
- Wait for the called party to answer.
- Press the RELEASE button - the two trunks are connected together.

Supervisor Secrecy

Description

The supervisor may "split" between calls (see Both Button Enable, Broker's Call, Both Mode Standard) and talk to each call without the other overhearing.

Conditions

None

Programming

None

Operation

- The supervisor may press the Source or Destination button and converse with either call privately.
- To talk to both the Source and Destination, the console may press the BOTH button.

Supervisor Serial Call

Description

This feature allows the supervisor to have incoming trunk calls automatically returned to the console when the original call is finished.

Conditions

- Supervisor Serial Call is available on all trunk calls.
- This feature and System Option 113 (GUEST ROOM Button Enable) are mutually exclusive .
- This feature and System Option 119 (Supervisor ROOM STATUS Button Enable and Display Enable) are mutually exclusive.
- This feature and System Option 121 (Supervisor Button Change Flash to Serial Call) are mutually exclusive.

Programming

- Select System Option 120 (Supervisor Serial Call).

Operation

To establish a Serial Call:

- Answer an incoming LDN call.
- Press the SERIAL CALL button.
- Dial the required extension number.
- Press the RELEASE button.

To answer a Serial Recall:

- ANSWER and RECALL lamps flash.
- Press the ANSWER button - ANSWER, RECALL, SOURCE and SERIAL CALL lamps are lit. The supervisor is connected to the recalling trunk.

To cancel a Serial Recall:

- ANSWER and RECALL lamps flash.
- Press the ANSWER button - ANSWER, RECALL, SOURCE and SERIAL CALL lamps lit.
- Press the SERIAL CALL button, SERIAL LED goes out. If the call is subsequently connected to another station, it will not recall.

Supervisor Station Busy-Out

Description

This feature allows the supervisor to busy-out any extension (the extension cannot originate or receive any calls), and to remove the busy-out condition. If the supervisor dials the number of a busied-out extension, the console will display the extension number and "oo" in the Destination display, the ERR lamp is lit, the busy lamp field shows the extension is busy, and the supervisor will receive reorder tone. The supervisor may display all extensions that have been busied-out on the console busy lamp field (see Locked-Out Display).

Conditions

- If the extension is idle or Hands-Free Idle when the supervisor dials the busy-out code, the extension will be busied-out immediately.
- If the extension is engaged when the supervisor dials the busy-out code, the extension is busied-out as soon as the extension becomes idle or Hands-Free Idle. If the extension has "Call Forwarding - Busy" or "Call Forwarding - Follow Me" set up, the forwarding will occur.
- If an extension has Call Forwarding in effect, and the extension forwarded to has been busied-out, the calling extension receives reorder tone.
- If the extension is a member of a hunt group, all calls to the hunt group will bypass the busied-out extension.
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Programming

- Select System Option 122 (Supervisor Station Busy Out Enable).

Operation

To busy out an extension:

- Dial *12.
- Dial the extension number, and *.
- Press the RELEASE button - the station is busied out.

To remove the Busy-Out Condition on an extension:

- Dial *12, the extension number, and #.
- Press the RELEASE button - the busy-out condition is removed.

Supervisor Time Display

Description

Each supervisor console is equipped with a digital clock that continuously displays the time-of-day in hours and minutes. The time may be displayed in 12- or 24-hour mode. The clock display is driven by pulses derived from the CPU master clock. The fact that the clock, is on is thus a direct indication that the CPU is running. The time displayed by the clock is used by Automatic Wake-Up, Message Waiting and Traffic Measurement.

Conditions

- Feature Number 18 (Supervisor Function) must be assigned an access code. For the purpose of the following description, this is assumed to be *.
- After a power failure, the clock will flash until the time has been set.

Programming

- If 12-hour time display is required, no clock options are required.
- If 24-hour time display is required, select System Option 150 (24-Hour Clock).

Operation

To set Time-of-Day:

- Dial *5.
- Dial the required hours.
- Dial 2-digit minutes.
- If time is p.m. (12-hour clock), press the * button.
- Press the RELEASE button - the time is set and the clock continues to run.

Supervisor-Timed Recall

Description

This feature automatically alerts the supervisor when a call extended through the console or a call held at the console has not been answered within the preselected time. Selectable recall times are:

- Supervisor-Timed Recall – Camp-On 20 s, 30 s or 40 s.
- Supervisor-Timed Recall – Don't Answer 20 s, 30 s or 40 s.
- Supervisor-Timed Recall – Hold 20 s, 30 s, or 40 s.

Conditions

- Recalls to the console are inoperative during night service, unless the call is a hold recall.

Programming

- For a Camp-On time-out of 20 s select System Option 123. Select System Option 124 for a time-out of 40 s. Neither option is selected for a time-out of 30 s (default time-out).
- For a Don't Answer time-out of 20 s select System Option 126. Select System Option 127 for a time-out of 40 s. No entry is selected for a time-out of 30 s (default time-out).
- For a Hold time-out of 20 s select System Option 128. Select System Option 129 for a time-out of 40 s. If neither option is selected, the time-out is 30 s (default time-out).

Operation

None

Supervisor Trunk Busy-Out

Description

The supervisor may make a trunk busy to prevent access to the trunk, and may remove the busy condition as required. If the Trunk Busy-Out Enable option is not selected, the supervisor may still access individual trunks, but is unable to force them into a busy condition.

Conditions

- Any extension dialing a busied-out trunk will receive busy tone and may not "camp-on" or initiate Automatic Callback - Busy.

Programming

- Select System Option 130 (Trunk Busy-Out Enable).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

To busy-out a Trunk:

- Dial *9, followed by the individual trunk access code (trunk equipment number).
- Dial *.
- Press the RELEASE button - the trunk is made busy.

To make a Trunk Non-Busy:

- Dial *9, followed by the individual trunk access code.
- Dial #.
- Press the RELEASE button - the trunk is made nonbusy.

Note: A trunk may be busied-out by the trunk busy-out switches on the Trunk Circuit card (see MITL9105/9110-090-500-NA, General Maintenance Information and MITL9105/9110-090-200-NA, Shipping, Receiving and Installation).

Switchhook Flash Timer

Description

This feature defines the maximum duration of a switchhook flash. An on-hook condition of longer than 200 ms will be considered by the software as a valid on-hook (disconnect). An on-hook condition of less than 190 ms is filtered by the line circuit hardware, and is not detected by the software. The maximum duration of a valid flash condition may be selected to be between the limits of: 700 ms, 900 ms, 1100 ms, or 1500 ms.

Conditions

None

Programming

- Select System Option 189 for a maximum flash time of 700 ms.
- Select System Option 190 for a maximum flash time of 900 ms.
- Select System Option 191 for a maximum flash time of 1100 ms.
- If neither of these options is selected, a maximum flash time of 1500 ms is in effect.

Operation

None

System Identifier

Description

This feature allows a unique identifier to be assigned to the system. This code identifies the system when central polling equipment is used for traffic data collection. It also appears on the customer data dump.

Conditions

None

Programming

- Select System Option 168 (System ID Enable).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

To enter a New System Identifier:

- Dial *17 – the system identifier is displayed in the console SOURCE display – if an identifier is not assigned the display shows 000.
- Dial the new system identifier (any digit 0–9).
- Press the RELEASE button – the display clears.

To display the System Identifier:

- Dial *17 – the console SOURCE display shows the current system identifier.
- Press the RELEASE button – the display clears.

Test Line

Description

The test line (equipment number 001) is hardwired to the test terminals on the maintenance panel. This line, in addition to normal extension facilities, has access to special features used for maintenance and testing. These exclusive features allow the service personnel to:

- Directly access an extension.
- Directly access a trunk.
- Set and clear busy-out condition of speech paths and receivers.
- Clear all busy-out conditions except trunks.
- Clear all errors.
- Select a specific speech path and receiver for use, and display their status.
- Initialize the hardware status of circuit cards.
- Reset the System.
- Reserve the printer for dump.
- Suspend the printout.
- Enable the printout.
- Ignore the printout.

Conditions

- Card position 1 must contain a Line card.

Programming

- Assign an unrestricted COS to equipment number 001.

Operation

- The operation of the Test Line is detailed in Section MITL9105/9110-090-500-NA, General Maintenance Information.

Through Dialing

Description

This feature allows the supervisor to select an outgoing trunk and connect the extension to the trunk. The call may be completed by the extension.

Conditions

- If toll denial is to be bypassed, the supervisor must access the trunk for the extension.

Programming

This feature may be restricted by including either of the following options in the station's COS:

- COS Option Number 59 (Non-CO trunks via Supervisor Inhibit).
- COS Option Number 60 (CO trunks via Supervisor Inhibit).

Operation

- The extension user lifts handset, and dials the Supervisor access code ("0").
- The supervisor answers the call, dials the trunk route access code, then presses the RELEASE button. The extension may now dial on the trunk.

Tie Trunks

Description

Tie trunks may be arranged to terminate on the console, at night bells, at extensions, in hunt groups, or they may be Dial-In Tie Trunks. Tandem operation may also be arranged. Tie trunks are arranged in groups in the same way as CO trunks. Extensions have access to tie trunk groups through the extension options selected in their Class of Service. Dial-In Tie Trunks are assigned a Class of Service in the same manner as extensions, and thus may be given access to selected ACD features.

Conditions

- Dial-In tie trunks may not access Paging, Hold Pickup, Directed Call Pickup, and Call Park.

Programming

- Set individual trunk and option switches as required (see Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation).
- Program trunk information.
- Program trunk group information.
- Program required extension COS options for access to tie trunk groups.
- If access to tie trunks via the supervisor is to be restricted, then COS Option Number 59 (Non-CO Trunks via Supervisor Inhibit) must be included in the COS of the restricted extensions.
- If tie trunks are to be connected to CO trunks via the supervisor, then System Option 130 (Supervisor CO to Non-CO Trunk Connect Enable) must be selected.
- If tie trunks are to be connected to other tie trunks via the supervisor, then System Option 109 (Supervisor Non-CO Trunk - Non-CO Trunk Connect Enable) must be selected.
- If System Option 253 (Call Forwarding - Busy (System, DID, Dial-In Tie Trunk, CCSA)) is selected, calls to busy extensions are forwarded to the supervisor.
- If System Option 254 (Call Forwarding - Don't Answer (System, DID, Dial-In Tie Trunk, CCSA)) is selected, calls to unanswered extensions are forwarded to the supervisor.

Operation

None

Timed Automatic Answer Supervision

Description

This option allows answer supervision to be given to an incoming Dial-In Tie Trunk accessing a CO trunk. Answer supervision may be supplied by the CO or the ACD system after a time-out of 10 seconds.

Conditions

- If System Option 159 (Inhibit Automatic Supervision) is enabled, only supervision from the CO will be given from the CO trunk.

Programming

None

Operation

None

Toll Control

Description

Toll Control denies an extension or Dial-In Tie Trunk the ability to make toll calls. Toll Control may be specified to be active on the first, or first and second digits dialed. Toll calls are defined as those calls which have a 0, 1, * or #, as the first or second digit after the trunk access code has been dialed, or as calls which receive toll supervision. Denial may be specified to be active on the first and second digits dialed.

Conditions

- To implement toll control it is recommended that Wait for Dial Tone be specified in the Trunk Group Type.
- Toll denial must be programmed both on extensions and trunk groups in order to be effective. This allows toll denial on a trunk group.

Programming

- Program toll control for trunk groups which will be restricted.
- If Toll Denial is to be implemented on detection of Toll Reversal, the first digit of the Trunk Group Type must be entered as 3.
- Program toll control for dial-in tie trunks which will be restricted.
- Program toll control for extensions which are to be restricted.
- If toll control is to be active only on the first digit dialed, select System Option 291 (Toll Control - First Digit). If Multi-Digit Toll Control is required, select System Option 292 (Toll Control - Multi-Digit). (See Section MITL9105/9110-090-212-NA, Multi Digit Toll Control.)

Operation

None

Toll Reversal

Description

Trunk Groups may be programmed to recognize that a reversal on a trunk represents a toll call detection by the Central Office. The first digit of the Trunk Group must be programmed as a Type 3

Conditions

None

Programming

- The First Digit of Trunk Group Type must be 3

Operation

None

Traffic Measurement

Description

Traffic measurements can be made on Generic 217 PABX Systems, and the results presented at an RS232C port for subsequent printout on a suitable output device (e.g. printer or magnetic tape unit). The types of measurements made include the following:

- Trunk Group peg usages.
- Incoming trunk peg counts and usages.
- Console traffic data counts.
- System elements usage data.

Information is accumulated during a 1 hour block, and is then available for printout. The start time and number of consecutive data blocks during each day is specified from the supervisor console. The manner in which the data is to be output is selected by System Options. The system can also provide traffic measurement data to an external agency by means of the following two mutually exclusive features, programmable by the selection of the appropriate system option:

- Polling by external devices.
- Automatic data printout.

Conditions

None

Programming

- See Section MITL9105/9110-090-450-NA, Station Message Detail Recording for full details.

Operation

- See Section MITL9105/9110-090-450-NA, Station Message Detail Recording for full details.

Transfer Dial Tone

Description

Selection of this option returns transfer dial tone in place of regular dial tone. This occurs when the extension flashes the switchhook to put an established call on Hold in order to Park, Consult or Transfer the call. Regular dial tone is 350/440 Hz continuous tone; Transfer Dial tone is 350/440 Hz, three bursts of 100 ms on, 100 ms off, followed by continuous tone.

Conditions

None

Programming

- Select System Option 220 (Transfer Dial Tone).

Operation

None

Transfer with Privacy

Description

This option allows an extension to converse with two extensions privately and connect them by hanging up (see also Broker's Call).

Conditions

- An extension with Transfer with Privacy may access the Call Park, Call Hold, Call Hold and Retrieve, and Paging features after flashing a call.
- The transferring extension may only talk to one of the other extensions at a time.
- COS Option 98 (Transfer with Privacy) and COS Option 49 (Station Conference) are mutually exclusive.
- An extension with COS Option 47 (Never a Consultee) may not be consulted.
- COS Option 98 (Transfer with Privacy) and COS Option 62 (Flash for Supervisor) are mutually exclusive.
- System Options 183 (Cannot Dial a Trunk After Flashing) and 184 (Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk), do not apply to an extension with Transfer with Privacy.
- COS Option 46 (Flash Disable) and COS Option 98 (Transfer with Privacy) are mutually exclusive.
- COS Option 48 (Broker's Call) and COS Option 98 (Transfer with Privacy) are mutually exclusive.

Programming

- The COS of the extension originating the transfer must contain COS Option Number 98 (Transfer with Privacy).
- One or more of the following System Options must be selected: System Option 181 (Can Flash if Talking to an Incoming Trunk), System Option 182 (Can Flash if Talking to an Outgoing Trunk), or System Option 180 (Can Flash if Talking to an Extension).

Operation

- Establish a call.
- Flash the switchhook – call is on hold.
- Dial the number of the second party – when the second party answers, you may toggle between parties by flashing the switchhook.
- If you hang up, both parties will be connected.

Transportable Class of Service

Description

Account codes may be stored with a Class of Service (COS) to be used when the Account Code is dialed. This enables a user to access a given COS from any extension providing the proper Account Code is dialed.

Conditions

None

Programming

None

Operation

- Lift handset – Dial tone is returned.
- Dial Account Code – Dial tone is returned.

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76
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Trunk Answer From Any Station (TAFAS) Available During the Day

Description

TAFAS Available During the Day allows incoming trunk calls to ring common alerting device(s) when the system is in Day Service. Any extension user, with the appropriate COS, may answer the call by dialing the required access code. The answering extension may exercise any feature associated with incoming calls that are normally available at the extension.

Conditions

- Extensions cannot flash, then dial a TAFAS code.

If a call is picked up (in Day Service) by TAFAS, then is transferred to an extension which does not answer, it will recall to the original station, not to the console.

Programming

- Select System Option 219 (TAFAS Available During the Day).
- The COS of answering extensions must include Option Number 54 (TAFAS Access).
- Access codes must be assigned to the required TAFAS features:
  Feature Number 14 – answer all TAFAS Groups
  Feature Number 15 – answer TAFAS Group 1
  Feature Number 16 – answer TAFAS Group 2
  Feature Number 17 – answer TAFAS Group 3.
- Trunk day assignments may be made for Night Bells 1, 2 and 3.

Operation

- An incoming CO trunk call, causes the common alerting device and the console (if handset is plugged in) bell to ring.
- At extension, lift handset – dial tone is returned.
- Dial the TAFAS code – converse with the incoming trunk.

Trunk Answer From Any Station (TAFAS) (Night Service)

Description

TAFAS allows incoming calls, normally directed to the supervisor, to appear also at a common alerting device when the system is in Night Service (or when TAFAS Day Service has been specified, see TAFAS Available During the Day). TAFAS enables any extension user with the correct COS to answer incoming calls appearing at the common alerting devices. TAFAS 1, 2 and 3 access codes are used to answer calls ringing at common alerting devices 1, 2 and 3. The TAFAS ALL access code allows the user to answer any call appearing at any alerting device. The answering extension may exercise any feature associated with the incoming call that is normally available at that extension.

Conditions

- A maximum of three individual TAFAS groups are available.
- Calls to common alerting devices will ring the console on their assigned LDN if the console handset or headset is not removed.

Programming

- The COS of answering extensions must include Option Number 54 (TAFAS Access).
- Access codes must be assigned to the required TAFAS features:
  Feature Number 14 – answer all TAFAS Groups
  Feature Number 15 – answer TAFAS Group 1
  Feature Number 16 – answer TAFAS Group 2
  Feature Number 17 – answer TAFAS Group 3.
- Trunk NIGHT assignment must include assignment to Bell 1, 2, or 3.

Operation

- An incoming CO trunk call, causes the common alerting device and the console (if handset is plugged in) bell to ring.
- At extension, lift handset – dial tone is returned.
- Dial the TAFAS code – converse with the incoming trunk.

Trunk Busy-Out Enable

Description

Selection of this option allows the supervisor to make a trunk busy to prevent access to the trunk, and to remove the busy condition as required. If this option is not selected the supervisor may still access individual trunks, but is unable to force them into a busy condition.

Conditions

None

Programming

- Select System Option 130 (Trunk Busy-Out Enable).
- Assign an access code to Feature Number 18 (Supervisor Function), usually * as indicated under Operation.

Operation

To Busy-Out a Trunk:

- Dial *9 followed by the individual trunk access number (trunk equipment number).
- Dial *.
- Press the RELEASE button – the trunk is made busy.

To make a Trunk Nonbusy:

- Dial *9 followed by the individual trunk access number.
- Dial #.
- Press the RELEASE button – the trunk is made nonbusy.

Note: A trunk may also be busied out by the trunk busy-out switches on the Trunk Circuit card (see MITL9105/9110-090-500-NA, General Maintenance Information and MITL9105/9110-097-200-NA, Shipping, Receiving and Installation).

Trunk Groups

Description

This feature controls extension access to selected Trunk Groups. An extension has access to all trunk groups specified in its COS by dialing the assigned access code. See Trunk Groups – Hunting – Two Types.

Conditions

- A maximum of 12 individual trunk groups are available.
- A trunk may only be a member of one trunk group.
- All trunks within a trunk group must be of the same type.
- An overflow trunk group should contain trunks of the same type as the overflowing trunk group.
- Trunks must be programmed before trunk groups.

Programming

- Assign required trunk group types, access codes, toll denial and overflow information for each trunk group (see Section MITL9105/9110-090-210-NA, System Programming).
- The COS of the extension must contain the option numbers of the trunk groups (Option Numbers 65-76) to which access is allowed (see Section MITL9105/9110-090-210-NA, System Programming).
- If the extension is not permitted to overflow from one trunk group to another, the COS of the extension must contain Option Number 52 (Do Not Overflow).

Operation

None

Trunk Groups – Hunting

Description

This feature allows trunk group hunting to be set up as terminating or circular. If the trunk group is programmed as a terminating group, trunks are always selected in a predetermined order. If the trunk group is programmed as a circular group, trunks are selected in a distributed manner, the next free trunk being the new first choice.

Conditions

None

Programming

- See Trunk Groups for programming information.

Terminating

- All members of the trunk group are unique and are entered in the hunting sequence required.

Circular

- When programming a circular trunk group, the last entry in the trunk group must be identical to the first entry.

Operation

None

Trunk Lock Out Alarm

Description

This MINOR alarm indicates either one of three conditions. A trunk that does not receive a seize acknowledge, a trunk that does not receive a release acknowledge or a Recorded Announcement Card error. In such event, the trunk or RAC is automatically busied out. In each case the busy status may be cleared by using the console "Busy Trunk Release".

The error will appear as:

E030 – Slot Number – Trunk Equipment Number – Code Number

Code Number: 1– Indicates a No Seize
2– Indicates a No Release
3– Indicates a RAC Error

Conditions

None

Programming

None

Operation

None

Trunk Recall Partial Inhibit

Description

By selecting this option, all switchhook flashes that occur while an extension is on a trunk will be partially inhibited. This will avoid the system mistaking a hang-up for a switchhook flash and ringing the extension back (i.e. phantom ringback).

Conditions

- System Option 169 (Trunk Recall Partial Inhibit) is mutually exclusive with Call Park.

Programming

- Select System Option 169 (Trunk Recall Partial Inhibit).

Operation

None

Trunk-to-Trunk Connections (Supervisor)

Description

This feature allows the supervisor to connect any two trunks together, then release them from the console. The trunks involved may be CO and/or Non-CO trunks depending on the system options selected.

Conditions

- All trunks involved must provide release unless they are CO in which case one of them must provide release supervision in order to assure trunk release. Lack of release supervision will result in trunks being "hung up".

Programming

- If the supervisor is to be able to connect CO trunks to CO trunks, select System Option 107 (Supervisor CO Trunk - CO Trunk Connect Enable).
- If the supervisor is to be able to connect CO trunks to Non-CO trunks, select System Option 108 (Supervisor CO Trunk - Non-CO Trunk Connect Enable).
- If the supervisor is to be able to connect Non-CO trunks to Non-CO trunks, select System Option 109 (Supervisor Non-CO Trunk - Non-CO Trunk Connect Enable).
- Any combination of the above System Options may be selected, providing complete flexibility.

Operation

- Answer the incoming trunk call.
- Dial the access code for the outgoing trunk group required.
- Dial the required number.
- When the called party answers, announce the call.
- Press the RELEASE button.

Trunk-to-Trunk Connections (Extensions)

Description

This feature allows an extension user who has an established trunk call, to hold the call and dial a second trunk. The user may then converse privately with the third party, transfer between parties or form a 3-party conference. This feature may be inhibited on an extension or on a system basis.

Conditions

- At least one extension in the conference must remain in the connection.

Programming

- Select System Options 181 (Can Flash if Talking to an Incoming Trunk) and 182 (Can Flash if Talking to an Outgoing Trunk).
- COS of extension must include the required trunk group Option Numbers (65 through 76).

Operation

- Establish a 2-party trunk call.
- Flash the switchhook - the first party is put on hold, dial tone is returned.
- Dial the required trunk group access code and directory number - 2-way conversation with the third party.
- Flash the switchhook to connect the held trunk to the existing call and form a 3-party conference (if COS option 49 is assigned) or to alternatively talk to each party (If COS Option Number 48 is assigned).

Vacant Number Intercept to the Supervisor

Description

Selection of this option causes all calls other than DID, CCSA or Dial-In Tie Trunk calls to vacant numbers or levels to be routed to the supervisor for completion. If this option is not selected, these calls receive reorder tone.

Conditions

- During Night Service, reorder tone is provided to extensions dialing vacant numbers or levels.

Programming

- Select System Option 137 (Intercept to Sup- Vacant Number)

Operation

None

Variable Timers

Description

Some time-out periods, e.g. switchhook flash (switchhook flash recognition) and recall times may be programmed.

Conditions

- If no System Option is selected, all time-outs default to standard timing.

Programming

- For a Message Registration Timer of 20 seconds, select System Option 194. Message Registration Default 30 seconds.
- For a Message Registration Timer of 40 seconds, select System Option 195.
- For a Park or Hold Recall of 2 minutes, select System Option 210. Park or Hold Recall Default 3 minutes.
- For a Park or Hold Recall of 4 minutes, select System Option 211.
- For a Supervisor-Timed Recall Camp-On of 20 seconds, select System Option 123. Supervisor-Timed Recall Camp-On Default 30 seconds.
- For a Supervisor-Timed Recall Camp-On of 40 seconds, select System Option 124. For a Supervisor-Timed Recall Don't Answer of 10 seconds, select System Option 125.
- For a Supervisor-Timed Recall Don't Answer of 20 seconds, select System Option 126. Supervisor-Timed Recall Don't Answer Default 30 seconds.
- For a Supervisor-Timed Recall Don't Answer of 40 seconds, select System Option 127.
- For a Supervisor-Timed Recall Hold of 20 seconds, select System Option 128. Supervisor-Timed Recall Hold Default 30 seconds.
- For a Supervisor-Timed Recall Hold of 40 seconds, select System Option 129.
- For a Night Service Time-Out of 20 seconds, select System Option 164. Night Service Time-Out Default 30 seconds.
- For a Night Service Time-Out of 40 seconds, select System Option 165.

- For a Call Forwarding – Don't Answer Time-Out of 10 seconds, select System Option 255.
- For a Call Forwarding – Don't Answer Time-Out of 20 seconds, select System Option 256. Call Forwarding – Don't Answer Time-Out Default 30 seconds.
- For a Call Forwarding – Don't Answer Time-Out of 40 seconds, select System Option 257.
- For a Single Digit Dialing Time-Out of 3 seconds, select System Option 214.
- For a Single Digit Dialing Time-Out of 5 seconds, select System Option 215.
- For a Switchhook Flash Timer of 0.7 seconds, select System Option 189.
- For a Switchhook Flash Timer of 0.9 seconds, select System Option 190.
- For a Switchhook Flash Timer of 1.1 seconds, select System Option 191.

Operation

None

Verifiable Account Codes (DISA)

Description

DISA trunks can dial an Account Code and have direct access to ARS and dial a Long Distance number. A caller who accesses a DISA trunk can directly dial an Account Code instead of an Access Code. By using an Account Code each DISA trunk can access his own COS. To enable the use of Account Codes as opposed to a single Access Code COS Option 110 (Special DISA) must be enabled for that DISA trunk. A DISA trunk can directly access ARS if the correct Account Code has been entered and if COS Option 111 (Direct to ARS) has been enabled for that DISA trunk.

Conditions

Verifiable Account Codes can only be of fixed length, i.e. 4, 6, 8 or 12 digits.

The amount of Account Codes available is as follows:

4 Digits - 1000
6 Digits - 946
8 Digits - 710
12 Digits - 473

Programming

- See Description of Direct Inward System Access (DISA) in this section.
- Select COS Option 110 (Special DISA) to create Multiple DISA Access Codes.
- Select COS Option 111 (Direct to ARS) to enable the DISA trunk who has correctly dialed an Account Code to be routed to ARS.
- Select System Option 230 (Account Code Enable).
- Select System Option 231 (Verifiable Account Codes).
- Select System Option 232 (Account Code Length 4 Digits) for Account Code length of 4 digits.
- Select System Option 234 (Account Code Length 8 Digits) for Account Code length of 8 digits.
- Select System Option 235 (Account Code Length 12 Digits) for Account Code length of 12 digits.
- If no Account Code length options are selected, the default will be 6 digit Account Codes.

Operation

To access the system:

- Dial the required directory number from a DTMF telephone.
- The system returns two bursts of ringback tone followed by dial tone.
- Dial the DISA Access Code - ACD system dial tone is returned.

Verifiable Account Codes (DISA)

Description

DISA trunks can dial an Account Code and have direct access to DDD and dial a Long Distance number. A caller on a DISA trunk can directly dial an Account Code. Access Code System an Account Code each DISA trunk can be assigned a CoS. Changing the use of Account Codes as up used to allow Access Codes Option 110 (Special DISA) must be enabled. A DISA trunk can directly access ARS if the correct Account Code has been entered and if COS Option [illegible] ID will be ARS1 as valid enabled for that DISA trunk.

Conditions

Verifiable Account Codes are comprised of fixed length 1, 2, 3, 4, 5, 6, 7, 8 digits.

The amount of Account Codes available is as follows:

4 Digits - 1000
6 Digits - 946
8 Digits - 710
12 Digits - 473

Programming

- See Description of Direct Inward System Access (DISA) in this section.
- Select COS Option 110 (Special DISA) to create Multiple DISA Access Codes.
- Select COS Option 111 (Direct to ARS) to enable the DISA trunk who has correctly dialed an Account Code to be routed to ARS.
- Select System Option 230 (Account) to enable
- Select System Option 231 (Verifiable Account Codes)
- Select System Option 232 (Account Code Length 4 Digits) for Account Code length of 4 digits.
- Select System Option 233 (Account Code Length 6 Digits) for Account Code length of 6 digits.
- Select System Option 234 (Account Code Length 8 Digits) for Account Code length of 8 digits.
- If no Account Code length is selected the default will be 6 digit Account Codes.

Operation

To access the system:

- Dial the required directory number. Dial a DDM number.
- The system returns two tones. Dial the Access Code followed by the tone.
- Dial the DISA Access Code - ACC system dial tone is returned.

SUPERSET 3™

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1. GENERAL

Introduction

1.01 This Section contains a description of the features and services provided by the SUPERSET 3.

Reason for Issue

1.02 This Section is issued to include the features and services of the SUPERSET 3 when used with SX-100® and SX-200® Automatic Call Distribution (ACD) Systems.

General Information

1.03 This Section contains a description of the features and services provided by the SUPERSET 3.

1.04 The features and services available are determined by the ACD the SUPERSET 3 is used with.

1.05 The SUPERSET 3 can be used only with the Subscriber Line Interface Card (SLIC).

1.06 Detailed instructions for the programming of each feature and service are given in the following MITEL Practices:

SX-100/SX-200

- MITL9105/9110-090-105-NA, Features and Services Description
- MITL9105/9110-090-210-NA, System Programming.

2. DEFINITIONS

2.01 **Prime Key** — It is the primary line on the SUPERSET. The extension number is the SUPERSET's identity.

2.02 **Personal Outgoing Line** — Used for outgoing calls only. It separates the prime line into outgoing and incoming parts. Allows an outgoing call without making the prime line busy to incoming calls. It shares programming information with the prime line.

2.03 **Key Line** — This is a line that has an extension number that may or may not be a SUPERSET prime line. It may appear on one SUPERSET or several. All appearances will light up together. Variants can be programmed independently. If busy on one set, it is busy on all sets. Privacy release is needed to allow a second set to connect to this line.

2.04 **Multiple Call** — Dial the number assigned to the key and any set with an appearance may answer. Only sets programmed to ring will ring. Immediately after answer, it is available for an incoming call to all remaining appearances. You can have as many simultaneous incoming calls as you have appearances. An incoming call lights all

idle appearances of the line. Once answered, only the set answering stays lit.

Outgoing, all sets not using the line for an incoming call may make simultaneous outgoing calls with independent lights.

Incoming and outgoing usage is subject to variant programming that is independent for all sets.

2.05 **Direct Trunk Select** — A line key that can access a PBX trunk directly. It can be used for incoming and outgoing calls, subject to variant programming; can appear on several SUPERSETs, can be transferred to both SUPERSETs and regular sets. The trunk must have both trunk and trunk group programming completed to assign it to a SUPERSET. Trunk group programming gives the trunk, toll diversion and type information. The DTS can be added to an existing trunk group or an independent trunk group. If added to an existing trunk group, it cannot be accessed by that trunk group's access code. A programming printout will have a star (*) to the right of all appearances of this trunk in the printout.

2.06 **Private Line** — A line key can access a C.O. line directly. SUPERSETs are registered multi functional (MF) to accomodate this type of operation where the operating TELCO provides a less expensive line rate for keysets. The DTS information applies except for being able to transfer to other sets. It can only be used by sets having a line button assigned to the private line. Several sets can be used simultaneously with the operation of the privacy release key.

3. FEATURES AND SERVICES DESCRIPTION

Introduction

3.01 This Part contains a description of the features and services available at a SUPERSET 3. Only those features and services that are special to SUPERSET 3 users, or are activated at a SUPERSET 3 in a way different to the method used by a standard telephone instrument user, are described. Other features and services of the ACD that are also available to standard telephone instrument users are not described (refer to the Features and Services Description practice). Each description contains:

- **Description** – a detailed description of the feature or service.
- **Conditions** – any special conditions which are required before selecting the feature or service.
- **Programming** – the parameters which must be programmed to allow selection and operation of the feature or service.
- **Operation** – a brief description of feature or service operation.

For further information, and for programming details, refer to the Features and Services Description practice, Section MITL9105/9110-090-105-NA.

3.02 This Part lists all feature descriptions in alphabetical order. The names of the features used refer directly to the text of the ACD documentation as closely as possible, to allow direct reference from any part of the documentation.

Broker's Call

Description

Broker's Call allows a SUPERSET 3 user, while engaged in a call, to hold the first call and originate a new call. Once the new call has been established, the originating extension may alternate between the parties, and carry on a PRIVATE conversation with either party. If the extension originating the Broker's Call hangs up with a party on hold, the extension is rung back by the held party. (See also Station Transfer Consultation Hold/Add-On, Transfer with Privacy.)

Conditions

The originating extension and only one of the other parties may be in the talking connection at any time.

Programming

None

Operation

- After establishing a call, press the TRANS/CONF feature button - transfer dial tone is returned, and the original called party is placed on hold.
- Dial the number of the next party - when this party answers there can be a 2-way private conversation.
- If the dialed party is busy or doesn't answer, press the CANCEL feature button - the original called party is now taken off hold.
- To alternate between parties, press the SWAP feature button.

Call Hold

Description

Call Hold allows a SUPERSET 3 user engaged in an active call, to place the call on hold, then to replace the handset or use the extension for other calls. All features normally active on the extension may be selected while the call is held. A held call may be retrieved locally or at another SUPERSET that has an appearance of the line the call is held on. A call held on a line other than a line on which a conference has been organized may be added to that conference. All calls appearing at a SUPERSET 3 may be put on hold.

Conditions

An attendant cannot be put on hold.

Programming

- Select System Option 210 for a recall time of 2 minutes or System Option 211 for a recall time of 4 minutes. If neither of these options is selected, the recall time will be 3 minutes.

Operation

To Place a Call on Hold:

- Inform the caller, then press the red HOLD button. The call is held and the caller hears music, if provided. The holding SUPERSET 3 may select another line to make or receive calls, access features in the normal manner, or hang up. The line status led associated with the call on hold, flashes as a reminder.

To Retrieve the Call Locally (at the holding SUPERSET 3):

- Press the line select button associated with the call on hold. The call is returned to the holding SUPERSET 3.

To Retrieve the Call Remotely (at another SUPERSET 3 that has an appearance of the line the call is held on):

- Press the line select button associated with the call on hold. The call is connected to the remote SUPERSET 3.

Hands-free Operation

Description

Hands-free operation allows a SUPERSET 3 user to speak with a caller or called party by means of the set speaker and microphone (the handset is left on-hook). The speaker on/off feature allows a SUPERSET 3 user to receive and make calls without lifting the handset. This feature can be activated during a call, or prior to making or answering a call, and can be used on any of the lines appearing at the set. The SUPERSET 3 user can also dial from the keypad, or use speed call or redial features, without previously lifting the handset, selecting a line, or obtaining dial tone.

Conditions

A Loop Trunk cannot be transferred to a SUPERSET in the Hands-free mode.

Programming

None

Operation

To Use the Hands-free Feature to Make or Receive Calls:

- Press the SPEAKER ON/OFF button.
- Select the line required to originate or answer a call. If originating a call, dial tone is heard from the speaker. If answering a call, the caller can be communicated with by means of the speaker and microphone.

On Completion of a Call:

- Press CANCEL button or SPEAKER ON/OFF button.

Note: The microphone can be turned off, (e.g., when required to consult privately with another person near the SUPERSET 3), by setting the MIC. switch to the OFF position.
At any time, the conversation can be made private by using the handset. Lifting the handset disables the speaker and microphone. To return to hands-free mode, press the SPEAKER ON/OFF button and replace the handset. Speaker and ringer volume can be adjusted by means of a single volume control.

Redial

Description

This feature allows a SUPERSET 3 user to automatically redial the last external number manually dialed from the keypad.

Conditions

Only the last external telephone number dialed manually is available for redial.

Programming

None

Operation

Press the REDIAL feature button. The last external telephone number is dialed automatically.

Speed Call

Description

This feature allows a SUPERSET 3 user to save frequently dialed telephone numbers and to access these numbers by pressing a single button. The quantity of speed call numbers available to a SUPERSET 3 user is dependent on the number of lines programmed to appear at the set. Any unused (unassigned) line select buttons can be used to save speed call numbers. Normally, the three buttons with LED indicators above them are used as lines; the remaining 12 buttons on the upper portion of the set are used for speed calls.

Conditions

None

Programming

See Section MITL9105/9110-090-220-NA for full details.

Operation

To Set Up or Modify a Speed Call Number:

- With the handset on-hook, press the PROGRAM/SAVE feature button.
- Press an unused speed call button.
- Dial the number to be stored. Insert into the dialing sequence:
  *1 - where a pause is required.
  *2 - where a wait for dial tone is required.
  *3 - where, during the automatic dialing sequence, dialing is suspended while other digits are dialed manually; e.g., the general number for directory assistance is 1 + (area code) + 555 + 1212 - the area code is to be dialed manually. The *3 has to be followed by a 2-digit number signifying the quantity of digits to be dialed. This number is between 01 and 16. In the directory assistance example, the number to be stored would be:

  9*13035551212

  where 9 is a trunk access code.

  To correct an entry, press the CANCEL feature button and then press the PROGRAM/SAVE button, and restart the sequence.

- Press the PROGRAM/SAVE feature button.
- The speed call number is now saved.

To Change a Saved Entry:

- Press the PROGRAM/SAVE button.
- Press the corresponding speed call button and dial the number to be stored.

Station Conference

Description

This feature allows a SUPERSET 3 user to set up a conference with up to six conferees (plus the originating extension), without the assistance of the attendant. The conferees may be any combination of extensions and trunks. To originate a conference, a SUPERSET user first establishes a 2-party call, then adds on the remaining conferees. Any extension in the conference with an appropriate Class of Service may add additional parties to the conference, to a maximum of seven. If the originator encounters a busy or unanswered extension number, he may return to the conference. If a CO trunk is to be added to the conference and the number dialed is incorrect, busy, or unanswered, the SUPERSET user can cancel that action, and the SUPERSET is automatically returned to the conference.

Conditions

A call cannot be held or transferred by an extension in a conference.

Programming

None

Operation

To Establish a Conference:

- Establish a 2-party call.
- Press the TRANS/CONF feature button - transfer dial tone is returned.
- Dial the number of the next conferee - ringback tone is returned. When the conferee answers, press the TRANS/CONF feature button. A 3-party conference exists.
- Any extension in the conference with the appropriate Class of Service can add additional parties to the conference.
- If the next conferee is busy or doesn't answer, press the CANCEL feature button - the SUPERSET is returned to the conference.
- If the next conferee is to be accessed via a CO trunk and the number dialed is incorrect, busy, or unanswered, press the CANCEL feature button - the SUPERSET is returned to the conference.

Station Transfer Consultation
Hold/Add-On, Transfer With Privacy

Description

This feature allows a SUPERSET 3 user on an established call to hold the call, add a third party to the call, transfer the original call to a third party, or speak privately with either of the called parties.

Conditions

None

Programming

If System Option 220 (Transfer Dial Tone) is selected, transfer dial tone is returned.

Operation

On an Established Call:

- Press the TRANS/CONF feature button - transfer dial tone is returned, the called party is held and hears music if provided.
- Dial the number of the required extension.
- If the number is busy or doesn't answer, press the CANCEL feature button to return to the held call.
- After the called party answers, private conversation with this party exists. To establish a 3-party call, press the TRANS/CONF feature button.

OR

- To connect held party with third party and to back out of conversation, press the CANCEL feature button - dial tone is returned.

OR

- To alternate between held and spoken parties, press the SWAP feature button.

SUPERSET 4™

FEATURES AND SERVICES DESCRIPTION

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1. INTRODUCTION

Reason for Issue

1.01 This Section is issued to include the features and services of the SUPERSET 4 when used with SX-100® and SX-200® Automatic Call Distribution Systems (ACDs).

General Information

1.02 This Section contains a description of the features and services provided by the SUPERSET 4.

1.03 The features and services available are determined by the ACD the SUPERSET 4 is used with.

1.04 The SUPERSET 4 can be used only with a Subscriber Line Interface Card (SLIC). Each SLIC can handle up to 8 SUPERSETs and each ACD system can handle up to 64 SUPERSETs.

1.05 Detailed instructions for the programming of each feature and service are given in the following MITEL Practices:

SX-100/SX-200

- MITL9105/9110-090-105-NA, Features and Services Description
- MITL9105/9110-090-210-NA, System Programming.

2. DEFINITIONS

2.01 **Prime Key** – It is the primary line on the set on a SUPERSET. The extension number is the SUPERSET's identity.

2.02 **Personal Outgoing Line** – Used for outgoing calls only. It separates the prime line into outgoing and incoming parts. Allows an outgoing call without making the prime line prime line busy to incoming calls. It shares programming information with the prime line.

2.03 **Key Line** – This is a line that has an extension number that may or may not be a SUPERSET prime line. It may appear on one SUPERSET or several. All appearances will light up together. Variants can be programmed independently. If busy on one set, it is busy on all sets. Privacy release is needed to allow a second set to connect to this line.

2.04 **Multiple Call** – Dial the number assigned to the key and any set with an appearance may answer. Only sets programmed to ring will ring. Immediately after answer, it is available for an incoming call to all remaining appearances. You can have as many simultaneous incoming calls as you have appearances. An incoming call lights all idle appearances of the line. Once answered, only the set answering stays lit.

Outgoing, all sets not using the line for an incoming call may make simultaneous outgoing calls with independent lights.

Incoming and outgoing usage is subject to variant pro programming that is independent for all sets.

2.05 **Direct Trunk Select** — A line key that can access a PBX trunk directly. It can be used for incoming and outgoing calls, subject to variant programming; can appear on several SUPERSETs, can be transferred to both SUPERSETs and regular sets. The trunk must have both trunk and trunk group programming completed to assign it to a SUPERSET. Trunk group programming gives the trunk, toll diversion and type information. The DTS can be added to an existing trunk group or an independent trunk group. If added to an existing trunk group, it cannot be accessed by that trunk group's access code. A programming printout will have a star (*) to the right of all appearances of this trunk in the printout.

2.06 **Private Line** — A line key can access a C.O. line directly. SUPERSETs are registered multi functional (MF) to accomodate this type of operation where the operating TELCO provides a less expensive line rate for keysets. The DTS information applies except for being able to transfer to other sets. It can only be used by sets having a line button assigned to the private line. Several sets can be use it simultaneously with the operation of the privacy release key.

3. FEATURES AND SERVICES DESCRIPTION

Introduction

3.01 This Part contains a description of the features and services available at a SUPERSET 4. Only those features and services that are special to SUPERSET 4 users, or are activated at a SUPERSET 4 in a way different to the method used by a standard telephone instrument user, are described. Other features and services of the ACD that are also available to standard telephone instrument users are not described (refer to the Features and Services Description practice for the appropriate ACD). Each description contains:

- **Description** – a detailed description of the feature or service.
- **Conditions** – any special conditions which should be taken into account before selecting the feature or service.

Note: As feature selection is a response to displayed prompts, no attempt can be made by a user to select a feature that is not available. When a prompt is displayed, the conditions applicable are as stated in this Section. Otherwise, the conditions are as described in the applicable ACD documentation.

- **Operation** – a brief description of feature or service operation.

For further information, and for programming details, refer to the Features and Services Description Practice, Section MITL9105/9110-096-105-NA.

3.02 This Part lists all feature descriptions in alphabetical order. The names of the features used refer directly to the text of the ACD documentation as closely as possible, to allow direct reference from any part of the documentation.

Account Codes

Description

A SUPERSET 4 user can enter one or more account codes:

- To authorize a call, or
- To associate an incoming or outgoing call with one or more account codes.

The Account Code may be 1 to 12 digits in length and appears on all SMDR records. An Account Code can be entered before dialing or during a call.

Conditions

None

Operation

- Obtain dial tone (if not on an established call).
- PRESS the SELECT FEATURE button.
- Dial 5 (feature number 5 is Account Code (5:ACC CODE)).
- Dial account code digits (DTMF tones are not heard).
- If making a trunk call, dial trunk access code, and dial directory numbers – when the originating extension hangs up an SMDR record is printed. This print-out includes the time of call, trunk used, duration of call, and Account Code.
- Press the SAVE feature button. The prompt ACKNOWLEDGED or PLEASE TRY LATER is displayed. PLEASE TRY LATER occurs if the recording process is busy.
- Press the EXIT feature button. The display reverts to the condition applicable at that time.

Note: There are two ways to correct an entry:

1. Use the – feature button to backspace to and clear the incorrect entry.
2. To cancel the entire entry, press the EXIT feature button.
3. Should Verifiable Account Codes be used (System Option 231), Account Codes can only be 4, 6, 8 or 12 digits in length.

Automatic Callback – Busy

Description

Automatic Callback – Busy allows a SUPERSET 4 user, upon encountering a busy extension or trunk group, to have the call completed when the extension or trunk group becomes idle. After the feature has been activated, the system continuously monitors the originating extension, and the called number. When both are idle, the system rings the originating extension, and when that extension goes off-hook, rings the called extension or accesses the trunk. If more than one callback request is active on any number, the requests are queued and serviced on a first-in, first-out basis.

Conditions

- A callback always rings the originating extension; call forwarding has no effect.
- Automatic Callback – Busy may be activated on extension numbers, hunt group access codes, and trunk group access codes.
- If the two parties involved in a callback, hold a telephone conversation (not a conference) before the callback is honoured, the callback is canceled automatically.
- Any callback outstanding for more than eight hours is canceled automatically.
- Duplicate callback requests are ignored (the original callback request is canceled).
- If a callback is not answered by the originating extension within six rings, it is automatically canceled.
- If the called party becomes busy before the originating party answers the callback, the originating party hears busy tone and the callback is canceled.

Operation

To Set Up an Automatic Callback – Busy:

- Dial the required extension number or trunk access code – busy tone is heard.
- Press the CALLBACK feature button – dial tone is returned and the SUPERSET 4 is available for normal use.

To Answer an Automatic Callback – Busy:

- The SUPERSET 4 rings.
- Lift the handset – either audible ringing tone is returned and the called number rings, or CO dial tone is heard.
- If on lifting the handset busy tone is heard, the callback has to be reactivated.

Automatic Callback – Don't Answer

Description

This feature allows SUPERSET 4 user, upon encountering an extension which does not answer, to have the call completed after the called extension has gone off- and then on-hook. After the feature has been activated, the system continuously monitors the originating extension and the required number. After the called extension goes off- and then on-hook, the callback is handled in the same way as an Automatic Callback – Busy. If more than one callback request is active on any extension, the requests are queued and serviced on a first-in, first-out basis.

Conditions

- A callback always rings the originating extension; call forwarding has no effect.
- Automatic Callback – Don't Answer may be activated on extension numbers and hunt group access codes.
- If the two parties involved in a callback, hold a telephone conversation (not a conference) before the callback is honoured, the callback is canceled automatically.
- Duplicate callback requests are ignored (the original callback request is canceled).
- If a callback is not answered by the originating extension within six rings, it is automatically canceled.
- If the called party becomes busy before the originating party answers the callback, the originating party hears busy tone and the callback is canceled.

Operation

To Set Up an Automatic Callback – Don't Answer:

- Dial the required extension number – the extension does not answer.
- Press the CALLBACK feature button and replace the handset – the SUPERSET 4 is available for normal use.

To Answer an Automatic Callback – Don't Answer:

- The SUPERSET 4 rings.
- Lift the handset – audible ringing tone is returned and the called number rings.
- If on lifting the handset busy tone is heard, the callback has to be reactivated.

Broker's Call

Description

The Broker's Call allows a SUPERSET 4 user, while engaged in a call, to hold the first call and originate a new call. Once the new call has been established, the originating extension may alternate between the calls, and carry on a PRIVATE conversation with either party. If the extension originating the Broker's Call hangs up with a party on hold, the extension is rung back by the held party. (See also Station Transfer Consultation Hold/Add-On, Transfer with Privacy.)

Conditions

- The originating extension and only one of the other parties may be in conversation at any time.
- Broker's Call takes preference over transfer with privacy.

Operation

- After establishing a call, press the TRANS/CONF feature button – transfer dial tone is returned, and the original called party is placed on hold.
- Dial the number of the next party – when this party answers there can be a 2-way private conversation.
- If the dialed party is busy or doesn't answer, press the CANCEL feature button – the original called party is now taken off hold.
- To alternate between calls, press the SWAP feature button.

Call Forwarding – Busy; Don't Answer; Follow Me; Busy/Don't Answer

Description

Call Forwarding – Busy (When Set's Busy)

This feature allows a SUPERSET 4 user to have all calls (which are directed to his/her extension number) forwarded either to the attendant, to another extension number within the system, or to an external number (via the SUPERSET 4 Speed Call facility), WHEN THE USER'S EXTENSION IS BUSY. While the feature is active and the extension is idle, calls may be made and received normally.

Call Forwarding – Don't Answer (When No Answer)

This feature allows a SUPERSET 4 user to have all calls (which are directed to his/her extension number) that are NOT ANSWERED WITHIN THE SELECTED TIME, forwarded either to the attendant, to another extension number within the system, or to an external number (via the SUPERSET 4 Speed Call facility). While the feature is active and the extension is idle, calls may be made and received normally.

Call Forwarding – Busy/Don't Answer (Busy/No Answer)

This feature allows a SUPERSET 4 user to have all calls (which are directed to his/her extension number) forwarded either to the attendant, to another extension number within the system, or to an external number (via the SUPERSET 4 Speed Call facility), WHEN THE USER'S EXTENSION IS BUSY or NOT ANSWERED WITHIN THE SELECTED TIME. While the feature is active and the extension is idle, calls may be made and received normally.

Call Forwarding – Follow Me (Always Forward)

This feature allows a SUPERSET 4 user to have all calls (which are directed to his/her extension number) forwarded either to the attendant, to another extension within the system, or to an external number (via the SUPERSET 4 Speed Call facility). The number to which the calls are forwarded (attendant or another extension only) is the only originating party that may call the forwarding extension while Call Forwarding – Follow Me is active. The forwarding extension may originate calls in the normal manner.

Conditions

- Call Forwarding has no effect on callbacks.
- Call Forwarding has no effect on calls directed to an extension via hunting.
- Only one type of Call Forwarding may be active at an extension at any time: if an extension has one type of Call Forwarding active and the user enters a new Call Forwarding type, the first type of Call Forwarding is canceled.
- Call Forwarding – Don't Answer has no effect if the SUPERSET 4 is operated in the auto-answer (hands-free) mode.

- If an invalid number is selected as a forwarding number, reorder tone is returned, and the alphanumeric display indicates this fact.
- Call Forwarding does not apply if the calling extension is the party to which the call would be forwarded.

Operation

The current Call Forwarding type and destination can be displayed on the alphanumeric display by pressing the display and CALL FWD feature buttons in that order.

To Set Up or Modify Call Forwarding:

- With the handset on-hook, press the PROGRAM feature button.
- Press the CALL FWD feature button.
- The alphanumeric display shows a Call Forwarding type. If the displayed type is required, press the YES feature button. If the type is not required, press the NO feature button: another Call Forwarding type is then displayed.
- Dial the Call Forwarding destination (if to another extension or the attendant) or if to an outside number, press the Speed Call (line select) button associated with that number.
- Check your Call Forwarding destination as displayed on the alphanumeric display. If correct, press the SAVE feature button. The Call Forwarding type and destination are now stored.
- Call Forwarding is now active, and the word FWD is displayed as a reminder.

There are two ways to correct a programming error before the SAVE feature button is pressed:

1. Use the – feature button to backspace to and clear the incorrect entry.
2. To cancel the entire current entry, press the EXIT feature button.

To Cancel Call Forwarding:

- Press the SELECT feature button.
- Dial '1' (feature number 1 is Call Forwarding (1:FWD)).
- Press the OFF feature button.

To Reactivate Call Forwarding:

- Press the SELECT feature button.
- Dial '1' (feature number 1 is Call Forwarding (1:FWD)).
- Press the ON feature button.

Call Hold

Description

Call Hold allows a SUPERSET 4 user engaged in an active call, to place the call on hold, then to replace the handset or use the extension for other calls. All features normally active on the extension may be selected while the call is held. A held call may be retrieved locally or at another SUPERSET 4 that has an appearance of the line the call is held on. A call held on a line other than a line on which a conference has been organized may be added to that conference. All calls appearing at a SUPERSET 4 may be put on hold. An attendant cannot be put on hold.

Conditions

None

Operation

To Place a Call on Hold:

- Inform the caller, then press the red HOLD button. The call is held and the caller hears music, if provided. The holding extension may select another line to make or receive calls or access features in the normal manner, or hang up. The line status display associated with the call on hold, flashes as a reminder.

To Retrieve the Call Locally (at the holding extension):

- Press the line select button associated with the call on hold.
- The call is returned to the holding extension.

To Retrieve the Call Remotely (at another SUPERSET 4 that has an appearance of the line the call is held on):

- Press the line select button associated with the call on hold.
- The call is connected to the remote SUPERSET 4.

To Add a Call on Hold to Another Line Which has Been Accessed:

- While hearing dial tone or during a conversation, press the ADD HELD feature button, then the line select button associated with the call on hold.

Call Pickup

Description

This feature allows a SUPERSET 4 user to answer any call to another extension in a pickup group of which the SUPERSET is a member. Calls to numbers in the pickup group that also appear at a SUPERSET 4 may be answered by selecting the line the call is ringing on.

Conditions

None

Operation

- Lift the handset – dial tone returned.
- Press the PICKUP feature button – the call is connected.

Camp-On

Description

A SUPERSET 4 user with Camp-On feature is able to indicate to a called but busy party that communication is desired, or is able to make a continuing request for a trunk when the trunk group is busy, and be connected to a trunk when one becomes free.

At this time a Camp-On (special busy) tone (350/440 Hz interrupted at 60 ipm) is received, and the called (camped-on) party hears a Camp-On tone (single burst of 440 Hz) if that party is not dialing or listening to a tone. If the camped-on extension is another SUPERSET 4, its features display also indicates that it has been camped onto.

When the busy extension hangs up, the calling extension receives audible ringing tone and the formerly busy extension is rung. If the busy extension is another SUPERSET 4, and its user selects the SWAP CAMP-ON feature, the camped-on caller is connected directly to the extension. If the busy extension is another SUPERSET 4, and its user elects to divert the call waiting, the camped-on caller is connected to a call forwarding destination.

Conditions

- Camp-On feature is not selected automatically.
- Camp-On tone is not supplied to trunks, or extensions using paging equipment.
- Paging equipment cannot be camped onto.
- An extension with a COS that includes Data Security can be camped onto, but Camp-On tone is not supplied.
- An extension on hold can receive Camp-On tone.
- If the called extension is on hold, and music on hold is provided, the music is suppressed while Camp-On tone is supplied.
- To divert the call waiting to a call forwarding destination, call forwarding feature need not be active. This feature is available for only 10 seconds after Camp-On.

Operation

To Camp-On to a Busy Party:

- While receiving busy tone, press the CAMP-ON feature select button. Remain off-hook.
- Camp-On (special busy) tone is returned, and the called party hears Camp-On tone: in the case of another SUPERSET 4, the SWAP CAMP-ON feature name is displayed.
- The busy extension hangs up, the camped-on extension user hears audible ringing tone, and the called extension rings.

OR

- The busy SUPERSET 4 SWAP CAMP-ON feature is selected and the calling party is connected.

OR

- The busy SUPERSET 4 CALL FWD feature is selected, and the calling party is diverted to the call forwarding destination.

To Answer a Camp-On Call:

- Camp-On tone is heard, and the SWAP CAMP-ON feature name is displayed.
- CALL FWD feature name is displayed for 10 seconds if a call forwarding destination (extension) has been programmed, and if that extension is not busy.
- Inform your current called party and press the SWAP CAMP-ON feature button. The current call is held, and the camped-on call is connected to the SUPERSET.

OR

- Press the CALL FWD feature button. The camped-on call is connected to the call forwarding extension.
- To return to the original caller (if SWAP CAMP-ON was selected), press the CANCEL feature button.
- To identify the camped-on party before answering, press the display then SWAP CAMP-ON feature buttons. If required, press the EXIT then the SWAP CAMP-ON or the CALL FWD feature buttons to answer the call.

Controlled Station Restriction (Do Not Disturb)

Description

The Do Not Disturb feature allows a SUPERSET 4 user to inhibit all incoming calls to the extension. Extension users calling a SUPERSET with Do Not Disturb activated, receive order tone. The attendant may override the feature. Other features (e.g., Hunting, Call Forwarding) work as if the extension is busy. Calls originating from an extension with this feature active are not affected in any way.

Conditions

- Reminder overrides Do Not Disturb.
- Executive Busy Override is not effective on Do Not Disturb.

Operation

To Set Do Not Disturb:

- Press the SELECT feature button.
- Dial '2' (feature number 2 is Do Not Disturb (2:NO DIST'B)).
- Press the ON feature button. The words NO DIST'B are displayed as a reminder while Do Not Disturb is in effect.

To Cancel Do Not Disturb:

- Press the SELECT feature button.
- Dial '2'.
- Press the OFF feature button.

Display

Description

This feature allows a SUPERSET 4 user to display on the set's alphanumeric display:

- speed call numbers
- identities of lines appearing at the SUPERSET
- last external number dialed manually
- reminder setting
- call forwarding type and destination
- identity of calling party, and
- name associated with a SUPERSET 4.

Conditions

To display a name, reminder or Call Forward the SUPERSET 4 must have a programmed name, reminder or Call Forward.

Operation

Press the DISPLAY button

- Press either the:
  - line select button, for saved speed call number, line or calling party identification
  - REDIAL feature button, for last external number dialed
  - REMINDER feature button, for current Reminder setting
  - CALL FWD feature button, for current Call Forwarding type and destination
  - NAME feature button, for name associated with the set.
- To clear the display, press the EXIT feature button. The display reverts to time of day and date.

Executive Busy Override

Description

This feature allows a SUPERSET 4 user who encounters a busy extension, to enter the conversation. Before override voice contact is established, both parties in the original conversation receive a warning tone (440 Hz for 800 ms). The tone continues for 200 ms after override is established. A 200 ms burst of 440 Hz tone is repeated every 6 s for the duration of the override. If the overridden extension flashes the switchhook or goes on-hook, the overriding extension is dropped and receives reorder tone.

Conditions

- The overriding extension cannot manipulate the original connection in any way.
- Any extension speaking to the attendant, dialing, or receiving supervisory tone cannot be overridden.
- An extension on hold cannot be overridden.
- An extension with a parked or held call cannot be overridden.

Operation

- Dial the extension number – busy tone is returned.
- Press the OVERRIDE feature button. After the warning tone the SUPERSET 4 is connected to the call.

External Call Forwarding

Description

This feature allows a SUPERSET 4 user to set up call forwarding to a number external to the ACD. This is accomplished by storing the external number as a speed call entry, and using the entry as the number to which the caller is forwarded.

Conditions

The extension must have one of the call forwarding options enabled and also have the capability of storing one or more speed call numbers.

Operation

Setting Up External Call Forwarding:

- Set up the required external number as a speed call entry (refer to Speed Call).
- Set up Call Forwarding to the speed call location (refer to Call Forwarding – Busy; Don't Answer; Follow Me; Busy/Don't Answer).

Hands-free Operation

Description

Hands-free operation allows a SUPERSET 4 user to speak with a caller or called party by means of the set speaker and microphone (the handset is left on-hook).

There are two differing modes of operation which are independently selected as either auto-answer, or speaker on/off features.

The auto-answer feature, when selected, permits an incoming call to the SUPERSET 4 extension (prime directory) number to be answered automatically and connected to the SUPERSET speaker and microphone. No action is necessary by the extension user. The caller receives 1 second of audible ringing tone and is then connected to the extension. The extension user hears a single ring as an indication of the incoming call. The station user can originate calls normally.

The speaker on/off feature allows a SUPERSET user to receive and make calls without lifting the handset. This feature can be activated during a call, or prior to making or answering a call, and can be used on any of the lines appearing at the set. The SUPERSET 4 user can also dial from keypad, or use speed call or redial features, without previously lifting the handset, selecting a line, or obtaining dial tone.

Description

- Call Forwarding - Don't Answer has no effect if the SUPERSET 4 is operated in the auto-answer mode.
- A callback cannot be honoured if the originating SUPERSET 4 is operated in the auto-answer mode.
- A Loop Trunk cannot call or be transferred to a SUPERSET in the Hands-free Mode.

Operation

To Operate a SUPERSET 4 in the Auto-Answer Mode:

- Press the SELECT feature button.
- Dial '3' (feature number 3 is auto-answer (3:AUTO ANS)).
- Press the ON feature button. With the handset on-hook, any incoming call to the SUPERSET extension number rings the set ringer once, and is then connected to the speaker and microphone.
- On completion of the call, when the call hangs up, the SUPERSET is rung once and the line becomes idle.

To Disable the Auto-Answer Feature:

- Press the SELECT feature button.
- Dial '3'.

- Press the OFF feature button.

To Use Hands-free Feature to Make or Receive Calls:

- Select the line required to originate or answer a call. If originating a call, dial tone is heard from the speaker. If answering a call, the caller can be communicated with by means of the speaker and microphone.

On Completion of a Call:

- Press the HANG-UP feature button.

The microphone can be turned off, e.g., when required to consult privately with another person near the SUPERSET 4, by pressing the MIC. ON/OFF button. The advisory words MIC. ON will disappear from the main display.

At any time, the conversation can be made private by using the handset. Lifting the handset disables the speaker and microphone. To return to hands-free mode, whether or not the auto-answer feature was used originally, press the SPEAKER ON/OFF button and replace the handset.

Speaker volume can be adjusted by means of a speaker volume control.

Help Call

Description

This description can be used to signal to the Supervisor that help is needed in handling a call.

Conditions

None

Programming

None

Operation

Press the HELP CALL Key.

Messaging

Description

This feature allows a SUPERSET 4 user to either:

1. Create short (up to 13 characters) advisory visual system-wide messages that can be read at other SUPERSETs when other SUPERSET users call the message originator; or

2. Send a visual message to a SUPERSET that is busy or isn't answered, requesting the called party to call the message sender.

Up to 15 advisory messages can be created by the set user (numbered 01 through 15). Messages 01 through 08 are preprogrammed but may be overwritten by the user. These are:

Message Number	Default Message
01	IN A MEETING
02	OUT OF TOWN
03	ON VACATION
04	OUT ON A CALL
05	OUT TO LUNCH
06	GONE FOR DAY
07	GONE HOME
08	IN TOMORROW
09-15	(BLANK)

The messages requesting another SUPERSET user to call the message sender is of the form:

CALL (NAME) AT (NUMBER)/(TIME)

Where (NAME) is the user's name associated with the sending SUPERSET (if saved, see Personal Identification), (NUMBER) is the extension number of the sending SUPERSET, and (TIME) refers to when the message was sent.

If user's name has not been saved, the message format is as follows:

CALL (NUMBER)/(TIME)

Where (NUMBER) is the extension number of the sending SUPERSET, and (TIME) refers to when the message was sent.

Messages can be read at any time (i.e., when the set is idle, or during a call).

Conditions

- A message is canceled automatically if the sender and receiver have a telephone conversation before the message is read.
- Messages are canceled after 24 hours.
- System-wide messages can be created or altered only from a SUPERSET 4 with the appropriate Class of Service.

Operation

To Set Up Advisory Messages:

- Press the PROGRAM feature button.
- Press the MSG feature button.
- In response to display DIAL IN MSG. NUM., dial message number (between 01 and 15 inclusive).

  - Messages 01 through 08 are preprogrammed as described. Selecting a message number in this group causes existing message to be overwritten.

In response to display NOW ENTER MSG, dial in the message as follows:

- Both number and alpha characters can be used in a message.

  - Buttons 2 through 9 and * on the keypad are identified with alpha characters. Press the button associated with the first character in the message, and a character is displayed in the alphanumeric display. If this character is not correct, repeated presses on the button cycle the display through the character for that button. When the displayed character is correct, press the NEXT feature button.
  - Repeat the above step for remaining characters in the message. For spaces, press the NEXT feature button again.

  There are two ways to correct a programming error:
  1. Use the – feature button to backspace to and clear an incorrect entry.
  2. To cancel the entire procedure before the message has been saved, press the EXIT feature button.

  - When the message is complete, press the SAVE feature button. The message is now saved.

To Activate an Advisory Message:

- Press the MSG feature button.
- If displayed message is inappropriate, press the NEXT feature button repeatedly to cycle through the repertoire of messages, or dial message number (01 to 15) if known.
- Press the ON feature button. The selected message is now effective. Any other SUPERSET user dialing a SUPERSET with a mes-

sage in effect sees the message displayed.

To Cancel an Advisory Message:

- Repeat procedure for activating a message, except press the OFF feature button.

To Receive an Advisory Message:

- When a SUPERSET with a message in effect is rung from another SUPERSET, the calling SUPERSET displays the number dialed, then the display gives the message. The other actions such as ringing or busy continue as normal.

To Send a Message Requesting a Callback:

- If the number dialed (another SUPERSET) is busy or isn't answered, press the SEND MSG feature button. The message, in the format described above, is sent to the called party, whose SUPERSET then displays the flashing word MSG.

To Receive a Message Requesting a Callback:

- A message requesting a callback is indicated on the receiving SUPERSET by the word MSG flashing on and off.
- If the receiving SUPERSET is idle, the message can be read as follows:
  - Press the MSG feature button. The display indicates the number of messages to be read.
  - Press the READ MSG feature button. The message is displayed.
  - If there are more messages to be read, the NEXT prompt is activated. To read additional messages, press the NEXT feature button.
  - To clear a message once it has been read, press the CANCEL feature button.
  - To respond to the request, press the CALL feature button, and the returned call is made automatically.
- If the message to the receiving SUPERSET is to be read during a call, proceed as follows:
  - Press the SELECT feature button.
  - Dial '4' (feature number 4 is message (4:MSG)).
  - Press the READ MSG feature button. The message is displayed.
  - If there are more messages to be read, the NEXT prompt is activated. To read additional messages, press the NEXT feature button.
  - To clear a message once it has been read, press the CANCEL feature button.

Music (Local)

Description

A SUPERSET 4 user can choose to hear music (generated from the same source as Music on Hold – if provided) via the set speaker. Music on Hold must be included as a system option. Music is generated from customer-supplied equipment.

Conditions

None

Operation

With the set idle, press the ♪ feature button. Loudness of the music is adjusted by means of the set speaker volume control.

Paging Access

Description

A SUPERSET 4 user with this feature is permitted access to the system paging equipment. If an extension tries to access busy paging equipment, busy tone is returned.

Conditions

- Camp-On or Automatic Callback - Busy may not be activated on busy paging equipment.
- Any paging announcement may be overridden by the attendant.
- If the attendant overrides an extension, the extension receives busy tone.

Operation

Press and hold down the PAGE feature button - the user hears a short pulse of tone, is then connected to the paging system, and may make the required announcement.

Personal Identification

Description

This feature allows a SUPERSET 4 user to enter and save his name, and to use this SUPERSET user association in messaging applications.

Note: To check the name saved at a SUPERSET, press the DISPLAY button, then the NAME feature button. The currently saved name is displayed on the alphanumeric display.

Conditions

None

Operation

To Set Up or Modify a Name:

- Press the PROGRAM feature button.
- Press the NAME feature button.
- In response to display DIAL IN NAME, dial in the name as follows:
  - Buttons 2 through 9 and * on the keypad are identified with alpha characters. Press the button associated with the first character in the name, and a character is displayed in the alphanumeric display. If this character is not correct, repeated presses on the button cycle the display through the character for that button. When the displayed character is correct, press the NEXT feature button.
  - Repeat above step for remaining characters in the name. For spaces, press the NEXT feature button again.

  There are two ways to correct a programming error:
  1. Use the ← feature button to backspace or to clear an incorrect entry.
  2. To cancel the entire procedure before the name has been saved, press the EXIT feature button.

  - When the name is complete, press the SAVE feature button. The name is now saved.

Privacy/Privacy Release

Description

A SUPERSET 4 user may have appearances of lines at his station that are shared with other SUPERSET users. Unless otherwise selected, privacy is automatic; i.e., another SUPERSET with an appearance of the line a SUPERSET 4 has accessed cannot break into the conversation. If so desired, the SUPERSET 4 user can permit the intrusion by activating the Privacy Release feature.

Conditions

Privacy and Privacy Release are effective only against stations with an appearance of line(s) the SUPERSET 4 user has. It has no effect on Executive Busy Override.

Operation

During an established call, press the PRIVACY REL feature button. Another SUPERSET user with an appearance of the same line can now enter the conversation by pressing the appropriate line select button.

Redial

Description

This feature allows a SUPERSET 4 user to redial automatically by pressing a single button, the last external telephone number dialed from the keyboard at that set.

Conditions

Only the last external telephone number dialed manually is stored automatically.

Operation

- Press the REDIAL feature button. The last external telephone number is dialed automatically.
- The last external number dialed may be displayed on the alphanumeric display by pressing the DISPLAY and REDIAL feature buttons in that order.

Reminder (Automatic Wake-Up, Alarm Call)

Description

This feature allows a SUPERSET 4 user to set up a timed reminder, such as an appointment reminder that rings the extension once at a prearranged time. When the system rings a SUPERSET 4 at the prearranged time, the alphanumeric display reads DISPLAY REMINDER to assist the user in acknowledging the reminder. After a timed reminder is answered, the SUPERSET 4 reverts to idle condition.

Conditions

- An extension with "Do Not Disturb" is overridden and rung at the requested time.
- The current alarm call setting can be displayed in the alphanumeric display by pressing the DISPLAY and REMINDER feature buttons in that order.

Operation

To Set or Modify a Timed Reminder:

- With the handset on-hook, press the PROGRAM feature button.
- Press the REMINDER feature button.
- Dial the alarm time in 24-hour clock format. The time is indicated on the SUPERSET 4 alphanumeric display.

  There are two ways to correct a programming error before the SAVE feature button is pressed:

  1. Use the ← feature button to backspace to and clear the incorrect entry.
  2. To cancel the entire current entry, press the EXIT feature button.

- Press the SAVE feature button. The system is now set to ring the originating extension at the programmed time.

To Cancel a Timed Reminder:

- With the handset on-hook, press the PROGRAM feature button.
- Press the REMINDER feature button.
- Press the CANCEL feature button.

To Acknowledge a Timed Reminder:

- The SUPERSET 4 rings once and the words DISPLAY REMINDER are displayed.
- Press the DISPLAY button.
- Press the REMINDER feature button.

Speed Call

Description

This feature allows a SUPERSET 4 user to save frequently dialed telephone numbers and to access these numbers by pressing a single button. The quantity of speed call numbers available to a SUPERSET 4 user is dependent on the number of lines programmed to appear at the set. Any unused (unassigned) line select buttons can be used to save speed call numbers.

To check saved numbers, press the DISPLAY button, then the required line select button. The currently saved speed call number is displayed on the alphanumeric display. Up to 16 digits can be displayed at once. If the saved number is greater in length, an arrow (–) is displayed. Press the – feature button to view the remaining characters.

Conditions

None

Operation

To Set Up or Modify a Speed Call Number:

- With the handset on-hook, press the PROGRAM feature button.
- Press the SPEED CALL feature button.
- Press an unused speed call button.
- Dial the number to be stored. Insert into the dialing sequence:
  *1 – where a pause is required.
  *2 – where a wait for dial tone is required.
  *3 – where, during the automatic dialing sequence, dialing is suspended while other digits are dialed manually, e.g., the general number for directory assistance is 1 + (area code) + 555 + 1212; the area code is to be dialed manually. The *3 has to be followed by a 2-digit number signifying the quantity of digits to be dialed. This number is between 01 and 16. In the directory assistance example, the number to be stored would be:

  91*3035551212

  where 9 is a trunk access code.
- Check the speed call number to be saved as displayed on the alphanumeric display. If correct, press the SAVE feature button. The speed call number is now saved.

  There are two ways to correct a programming error before the SAVE feature button is pressed:
  1. Use the – feature button to backspace to and clear the incorrect entry.
  2. To cancel the entire current entry, press the EXIT feature button.

Station Conference

Description

This feature allows a SUPERSET 4 user to set up a conference with up to six conferees (plus the originating extension), without the assistance of the attendant. The conferees may be any combination of extensions and trunks. To originate a conference a SUPERSET user first establishes a 2-party call, then adds on the remaining conferees. Any extension in the conference with an appropriate Class of Service may add additional parties to the conference, to a maximum of seven. If the originator encounters a busy or unanswered extension number, he may return to the conference. If a CO trunk is to be added to the conference and the number dialed is incorrect, busy, or unanswered, the SUPERSET user can cancel that action, and the SUPERSET is automatically recalled to the conference. A call cannot be held or transferred by an extension in a conference.

Conditions

None

Operation

To Establish a Conference:

- Establish a 2-party call.
- Press the TRANS/CONF feature button - transfer dial tone is returned.
- Dial the number of the next conferee - ringing tone is returned. When the conferee answers, press the CONF feature button. A 3-party conference exists.
- Any extension in the conference may add additional conferees to the conference.
- If the next conferee is busy or doesn't answer, press the CANCEL feature button - the SUPERSET is returned to the conference. If the next conferee is to be accessed via a CO trunk and the number dialed is incorrect, busy, or unanswered, press the CANCEL feature button - the SUPERSET is returned to the conference.

Station Transfer Consultation Hold/Add-On, Transfer with Privacy

Description

This feature allows a SUPERSET 4 user on an established call to hold the call, add a third party to the call, transfer the original call to a third party, or speak privately with either of the called parties.

Conditions

Calls may not be transferred to the paging circuit.

Operation

On an Established Call:

- Press the TRANS/CONF feature button – transfer dial tone is returned, the called party is held and hears music if provided.
- Dial the number of the required extension.

  - If the number is busy or doesn't answer, press the CANCEL feature button to return to the held call.

- After the called party answers, private conversation with this party exists.
- To establish a 3-party call, press the CONF feature button.

  OR

- To connect held party with third party and to back out of conversation, press the RELEASE feature button – dial tone is returned.

  OR

- To speak privately with only one party in a 3-party call, press the SPLIT feature button. The other party is put on hold. To alternate between held and spoken parties, press the SWAP feature button.

Trunk Answer From Any Station (TAFAS)

Description

TAFAS allows incoming trunk calls to ring common alerting device(s) when selected by the attendant, and to have the incoming call answered at a SUPERSET 4 with the appropriate Class of Service. The answering extension may exercise any feature associated with incoming calls that are normally available at the extension.

Conditions

- If a call is picked up by TAFAS, then is transferred to an extension which does not answer, it recalls to the original extension.
- An incoming CO trunk call, causes a common alerting device and the console bell to ring (if handset is plugged in).

Operation

- At the SUPERSET, lift handset – dial tone is returned.
- Press the NIGHT ANS feature button, and converse with the caller on the incoming trunk.

SX-100®/SX-200®
SUPERSWITCH®
ELECTRONIC AUTOMATIC CALL DISTRIBUTION SYSTEMS
PHYSICAL DESCRIPTION AND ORDERING INFORMATION
GENERIC ACD

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1. GENERAL

Introduction

1.01 This Section contains a brief description of the SX-100/SX-200 Automatic Call Distribution System, and the equipment ordering information.

Reason for Issue

1.02 This Section has been issued to provide ordering information for Generic ACD.

2. GENERAL DESCRIPTION

System Description

2.01 The SX-100/SX-200 ACDs are electronic switching systems. The SX-100 has 112 ports while the SX-200 has 208 ports available for assignment to lines, trunks and additional receivers. The remainder are reserved for control and special functions. The system is electrically compatible with most existing station, key telephone, Private Branch Exchange (PBX) and Central Office (CO) equipment and provides:

- The use of a flexible numbering plan.
- The simultaneous use of DTMF and rotary dial stations.
- Optional use of Supervisor Consoles – two maximum extensive selection of standard and optional features.
- Freedom from scheduled maintenance automatic diagnostics six power fail transfer circuits (SX-100), 12 power fail transfer circuits (SX-200) optional reserve power supply.

2.02 The system consists of a single cabinet (containing the switching equipment and the system power supplies), and a desk type Supervisor Console equipped with pushbutton dial pad and control keys. The equipment cabinet may be either free-standing or wall-mounted in the case of the SX-100.

2.03 All connections from the cross-connecting frame to the system are made using 25-pair connectorized cables. Connections between the cross-connecting frame, the Supervisor Console and external equipment are made in accordance with accepted practice.

2.04 A reserve power supply is available as an option. It is designed to maintain system operation for a minimum of two hours in the event of a commercial power failure.

2.05 Figure 2-1 shows a diagrammatic representation of the system configuration.

SX-100 Free-standing or Wall-mounting Equipment Cabinet

2.06 The SX-100 equipment cabinet (Figure 2-2) is of welded steel construction and measures 422 mm (16.62 in.) high, 635 mm (25 in.) wide, and 470 mm (18.5 in.) deep. A fully equipped cabinet weighs approximately 31.8 kg (70 lb). The door on the front of the cabinet provides access to the system maintenance panel, printed circuit cards and primary power supply controls. Access to the line and trunk connectors and the power supply cable harness is provided by removing the rear panel. Cable entry to the equipment cabinet is provided through cable duct at the rear of the cabinet.

SX-200 Equipment Cabinet

2.07 The SX-200 equipment cabinet (Figure 2-3) is of welded steel construction and measures 960 mm (38 in.) high, 600 mm (23.5 in.) wide, and 700 mm (27.5 in.) deep. A fully equipped cabinet weighs approximately 131.7 kg (290 lb). The door on the front of the cabinet provides access to the system maintenance panel, printed circuit cards and reserve battery supply shelf. The hinged rear panels hold the system power supply and provide access to the line and trunk connectors and the reserve power controls. Cable entry to the equipment cabinet is provided through cable ducts on either side of the cabinet.

2.08 The equipment cabinet holds the maintenance panel, a maximum of two equipment shelves (see Figure 2-4), the optional reserve battery supply and the primary power supply. The maintenance

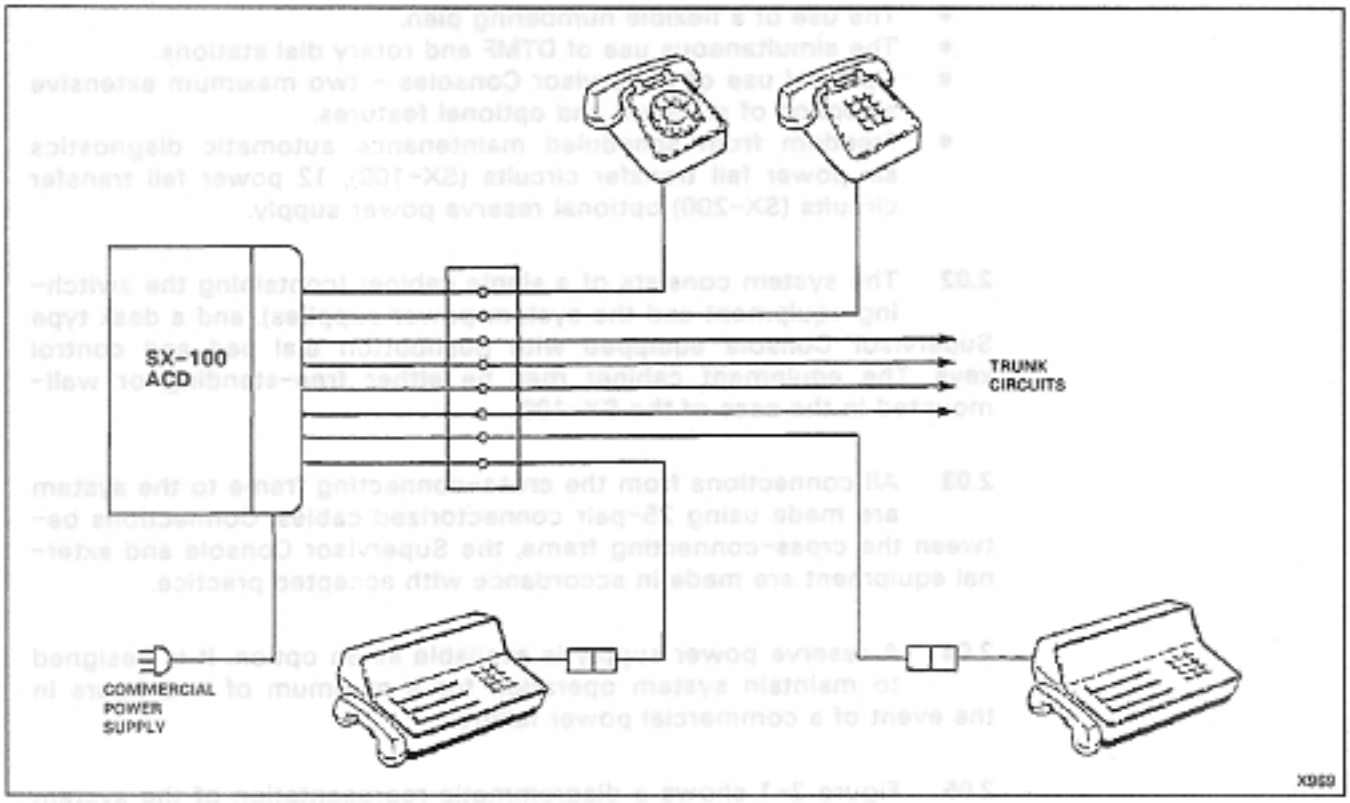


Figure 2-1 System Configuration

panel, mounted at the top of the cabinet, provides access to the system from the maintenance console through a 50-pin connector. To the left of the maintenance connector is a master power fail transfer switch and five power fail transfer control switches. A system power switch, with indicator, is provided on the panel. In addition, a test line is provided which allows service personnel to access individual lines and trunks. Mounted in the middle of the equipment cabinet is equipment shelf 1. This shelf holds all system control logic plus a number of trunk, line, and receiver cards. Above equipment shelf 1 is equipment shelf 2, which contains additional trunk and line cards. The optional reserve power supply is contained in a completely enclosed shelf located below shelf 1. All connections between shelves and external equipment are made by plug-ended cables from the rear of each shelf. The system primary power supply, held on the hinged back panel of the cabinet, converts the commercial input power to the required system voltage levels.

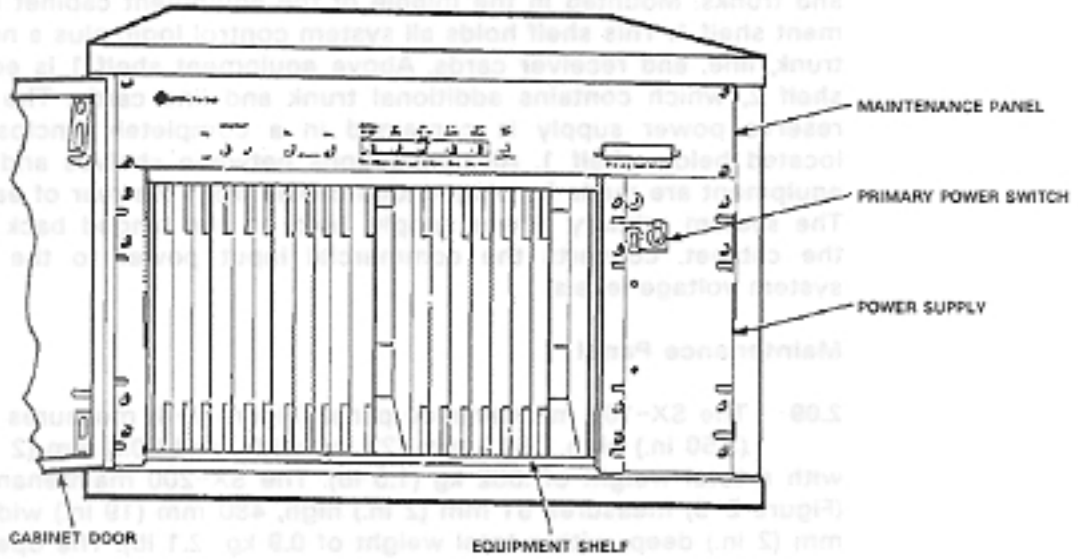
Maintenance Panel

2.09 The SX-100 maintenance panel (Figure 2-4) measures 88.9 mm (3.50 in.) high, 584.2 mm (23 in.) wide, and 50.8 mm (2 in.) deep, with a total weight of .682 kg (1.5 lb). The SX-200 maintenance panel (Figure 2-5) measures 51 mm (2 in.) high, 480 mm (19 in.) wide and 51 mm (2 in.) deep, with a total weight of 0.9 kg (2.1 lb). The operation of both panels is identical. The maintenance connector on the right of the panel permits service personnel to perform maintenance tasks and enter new, or modify existing customer data using the maintenance console. The test line terminals on the panel allow the use of a standard hand test-set (butt-in) to establish calls through the system using preselected circuits. The power switch controls the application of power to the equipment shelves.

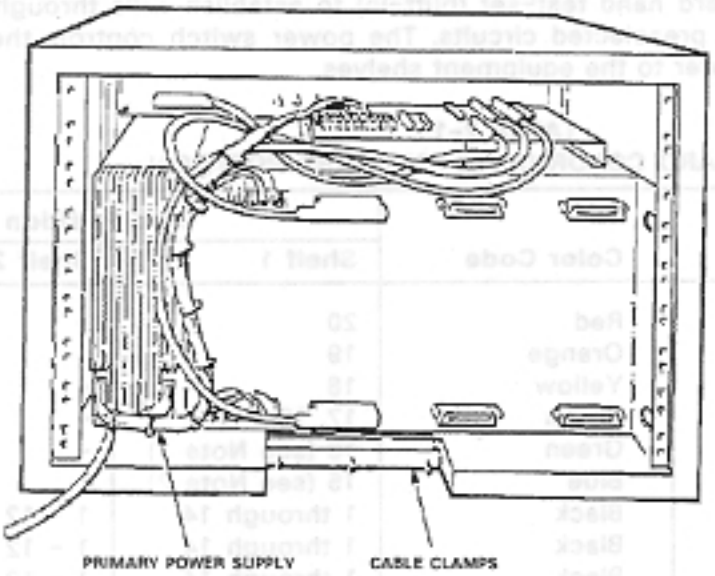
TABLE 2-1
CIRCUIT CARD COLOR CODE AND CARD POSITION R1

Circuit Card Name	Color Code	Card Position	
		Shelf 1	Shelf 2
IPC	Red	20	-
Scanner	Orange	19	-
Tone Control	Yellow	18	-
Console Control (Dual)	Green	17, 16	-
Remote Control - PABX (RCP)	Green	16 (see Note 1)	-
Receiver (Dual or Quad)	Blue	15 (see Note 2)	-
Line Circuit (8 station)	Black	1 through 14	1 - 12
Trunk Circuit (4 trunk)	Black	1 through 14	1 - 12
Trunk Circuit (2 trunk)	Black	1 through 14	1 - 12

Notes:
1. The Remote Control PABX card is supplied only when required for use with RMAT Systems (Section MITL9105/9110-098-101-NA). It occupies the slot normally used for the second console control card.
2. If additional receiver cards are used, they must be placed in the following card positions on shelf 1 - second receiver position 14, third receiver position 13, and fourth receiver position 12.



FRONT VIEW



REAR VIEW

WEIGHT	HEIGHT	WIDTH	DEPTH
31.8 kg (70 lb)	422 mm (16.62 in.)	635 mm (25 in.)	470 mm (18.5 in.)

X5611

Figure 2-2 SX-100 Equipment Cabinet

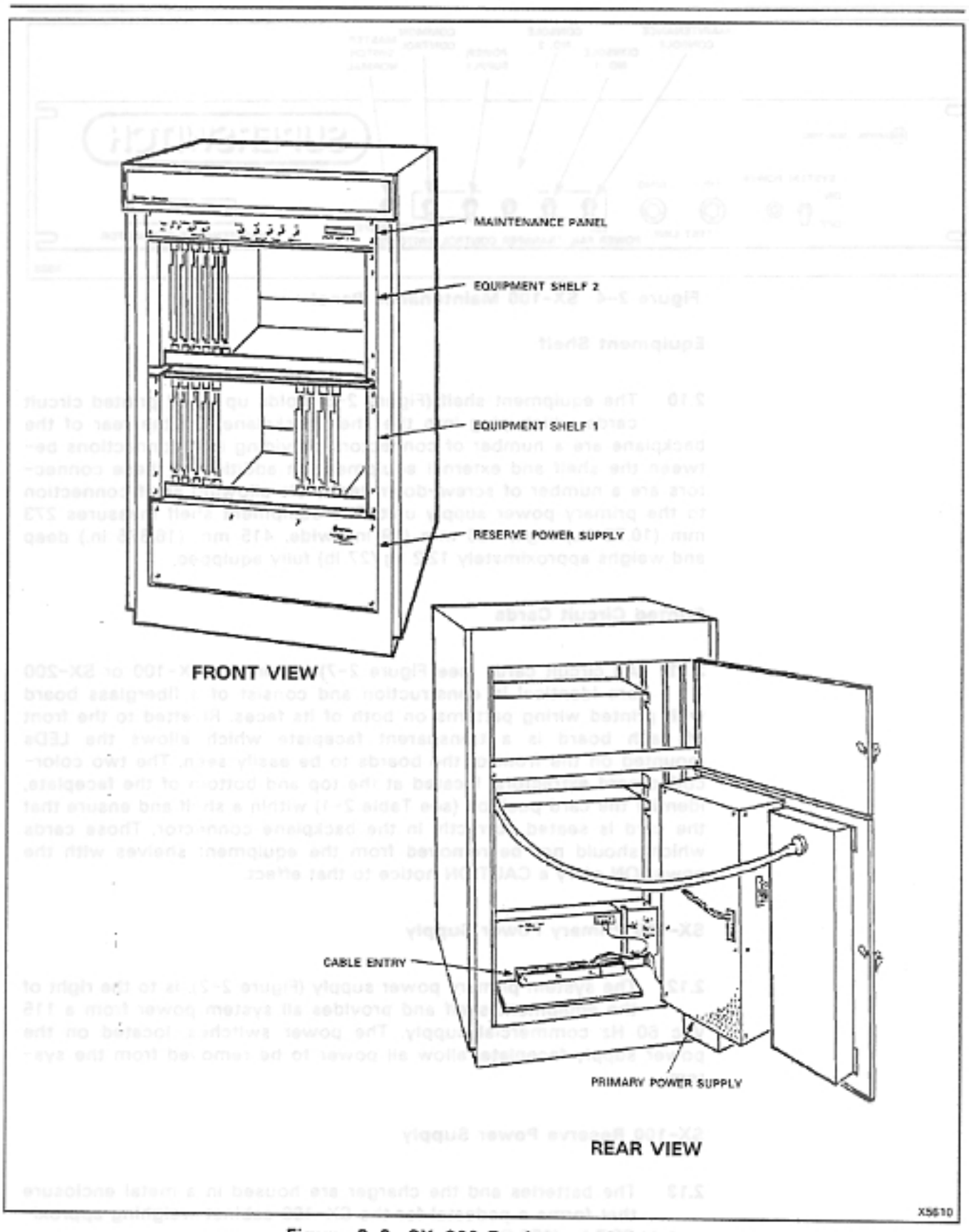


Figure 2-3 SX-200 Equipment Cabinet

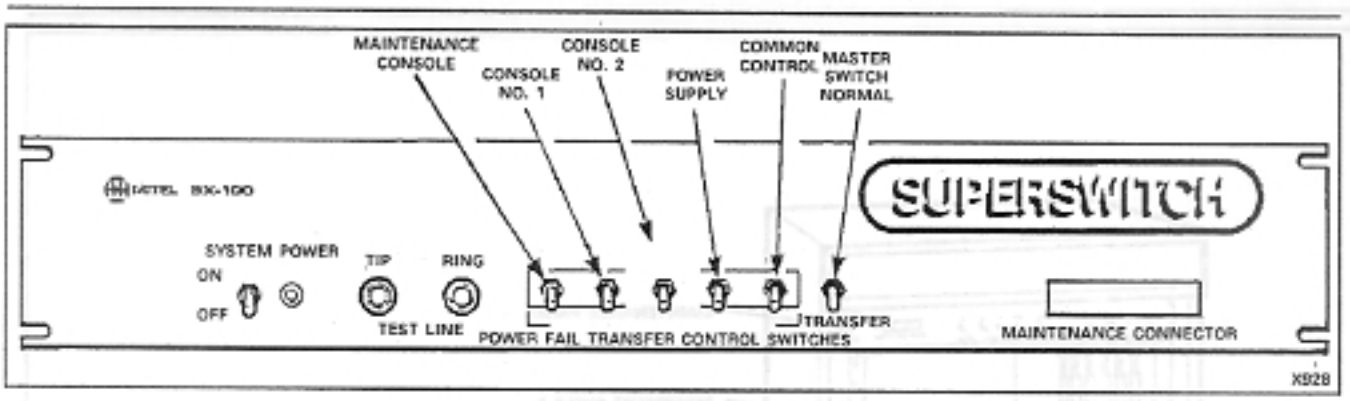


Figure 2-4 SX-100 Maintenance Panel

Equipment Shelf

2.10 The equipment shelf (Figure 2-6) holds up to 22 printed circuit cards which plug into the shelf backplane. On the rear of the backplane are a number of connectors providing interconnections between the shelf and external equipment. In addition to these connectors are a number of screw-down terminals allowing shelf connection to the primary power supply unit. The equipment shelf measures 273 mm (10.75 in.) high, 480 mm (19 in.) wide, 415 mm (16.375 in.) deep and weighs approximately 12.2 kg (27 lb) fully equipped.

Printed Circuit Cards

2.11 All circuit cards (see Figure 2-7) within the SX-100 or SX-200 are identical in construction and consist of a fiberglass board with printed wiring patterns on both of its faces. Rivetted to the front of each board is a transparent faceplate which allows the LEDs mounted on the front of the boards to be easily seen. The two color-coded card extractors, located at the top and bottom of the faceplate, identify the card position (see Table 2-1) within a shelf and ensure that the card is seated correctly in the backplane connector. Those cards which should not be removed from the equipment shelves with the power ON carry a CAUTION notice to that effect.

SX-100 Primary Power Supply

2.12 The system primary power supply (Figure 2-2), is to the right of the equipment shelf and provides all system power from a 115 Vac 60 Hz commercial supply. The power switches, located on the power supply faceplate, allow all power to be removed from the system.

SX-100 Reserve Power Supply

2.13 The batteries and the charger are housed in a metal enclosure that forms a pedestal for the SX-100 cabinet weighing approximately 56.7 kg (125 lb).

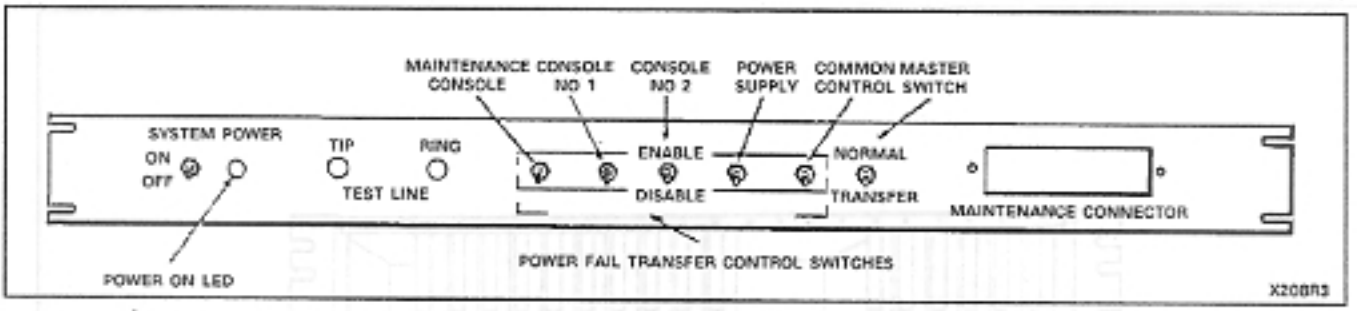


Figure 2-5 Maintenance Panel

SX-200 Primary Power Supply

2.14 The system primary power supply (Figure 2-3), mounted directly on the cabinet back panel, (total weight 32 kg (70 lb)) provides all system power from either a 115 Vac or a 230 Vac, 47 Hz to 63 Hz commercial supply. The power switch mounted on the outside face of the power supply permits all power to be removed from the system before the equipment cabinet is opened.

SX-200 Reserve Power Supply

2.15 The reserve power supply (Figure 2-3) consists of a battery charging unit and eight batteries providing 48.3 volts at 20°C (68°F). This supply will maintain complete system operation for a minimum of two hours in the event of a primary power failure. The temperature-compensated charging system maintains the correct battery voltage level. The reserve power supply is housed in a completely enclosed shelf measuring 180 mm (7 in.) high, 480 mm (19 in.) wide, 370 mm (14.5 in.) deep and weighing approximately 56.7 kg (125 lb).

Supervisor Console

2.16 The SX-100/SX-200 Supervisor Console (see Figure 2-8) is enclosed in a housing with a smoked faceplate. Located on either side of the console are a pair of headset/handset jacks allowing simultaneous operation and supervision. The console keyboard holds three rows of ten nonlocking keys for the selection of features and completion of calls. On the right of the keyboard is a 12-key pushbutton dial pad. The console display, mounted above the keyboard, displays the active states of call in progress. In addition to the Call Status Display is a Busy Lamp Field, a Trunk Group status field, a Call Waiting Indicator, a digital clock, and three Alarm Indicators. The weight of the Supervisor Console is approximately 5.9 kg (13 lb) and its dimensions are 350 mm (13.75 in.) wide, 176 mm (6.8 in.) high and 236 mm (9.25 in.) deep. A complete description of the Supervisor Console is contained in Section MITL9105/9110-090-315-NA, Supervisor Console Description.

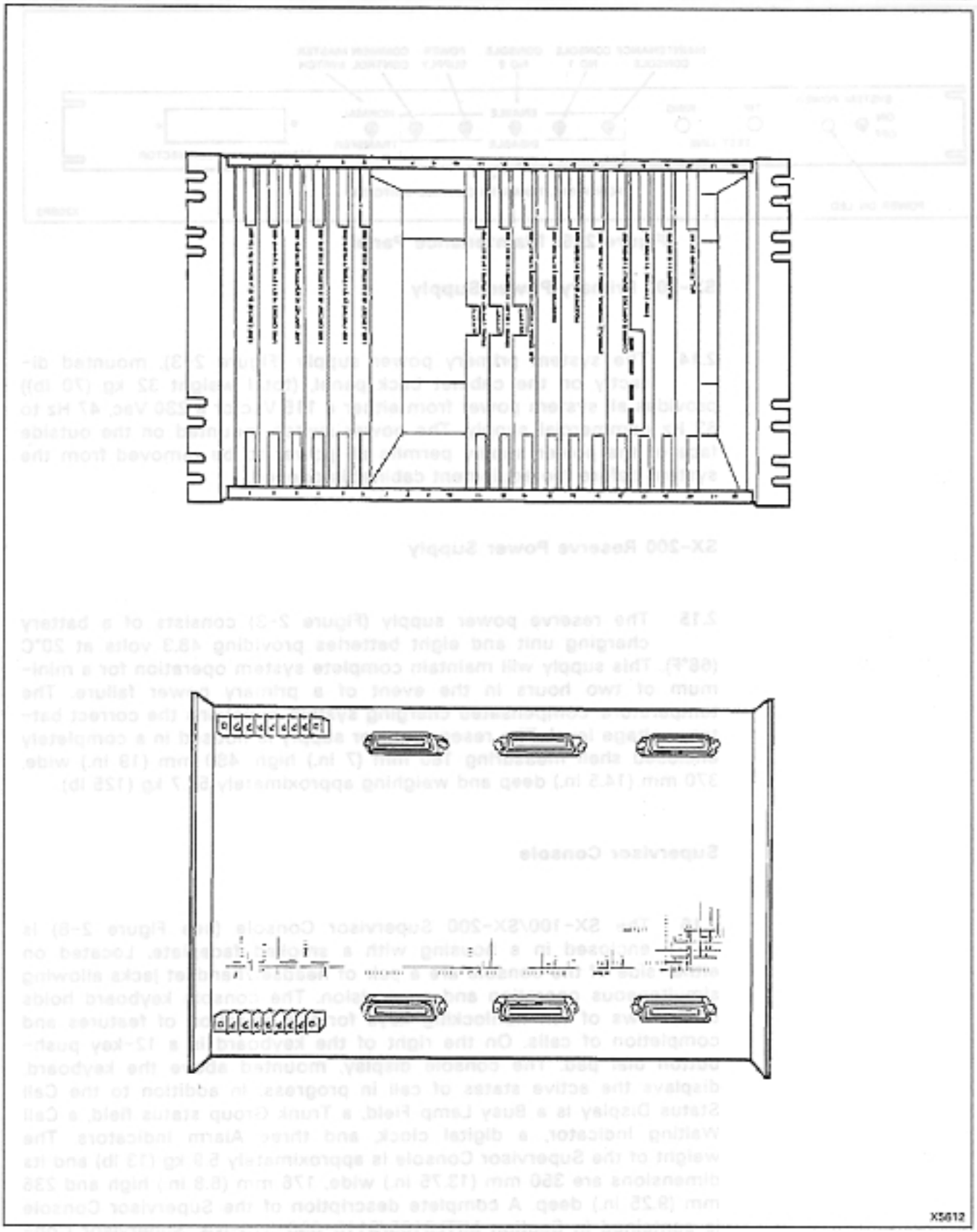


Figure 2-6 Equipment Shelf

Maintenance Console

2.17 The construction of the Maintenance Console is identical to that of the Supervisor Console; the only difference is in the functions of the call and feature selection keys. A complete description of the maintenance console is given in Section MITL9105/9110-090-315-NA, Supervisor Console Description.

3. DESCRIPTION

General

3.01 Each SX-100/SX-200 ACD is completely factory tested prior to packaging and shipment.

3.02 On arrival at the customer's premises, installation consists of unpacking the ACD, making the required connections between external equipment and the system, installing the required printed circuit cards, programming the system, and supplying commercial power. System capacity may be increased at any time by the addition of plug-in printed circuit boards.

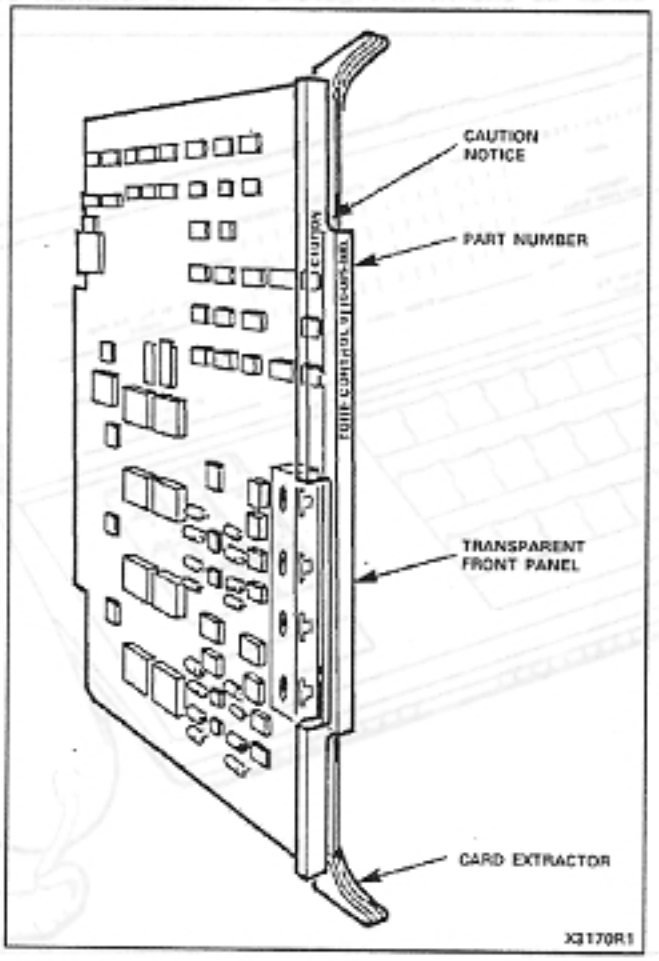


Figure 2-7 Typical Printed Circuit Card

Basic System

3.03 The basic system consists of the equipment cabinet, maintenance panel, power supply, and one equipment shelf.

Supervisor Console

3.04 The SX-100/SX-200 may be operated with or without an Supervisor Console. Consoles may be dedicated to a single customer or shared between customers. If an Supervisor Console is required, the console package plus the required console control card should be requested. For single console operation, the console control card is located in card position 17. If two consoles are employed, the second control card is placed in card position 16. For further information, see Section MITL9105/9110-090-315-NA, Supervisor Console Description.

Equipment Shelf

3.05 The equipment shelf contains the five common control cards plus the required number of line, console, trunk, and receiver cards as shown in Figure 3-1. The common control cards are color-

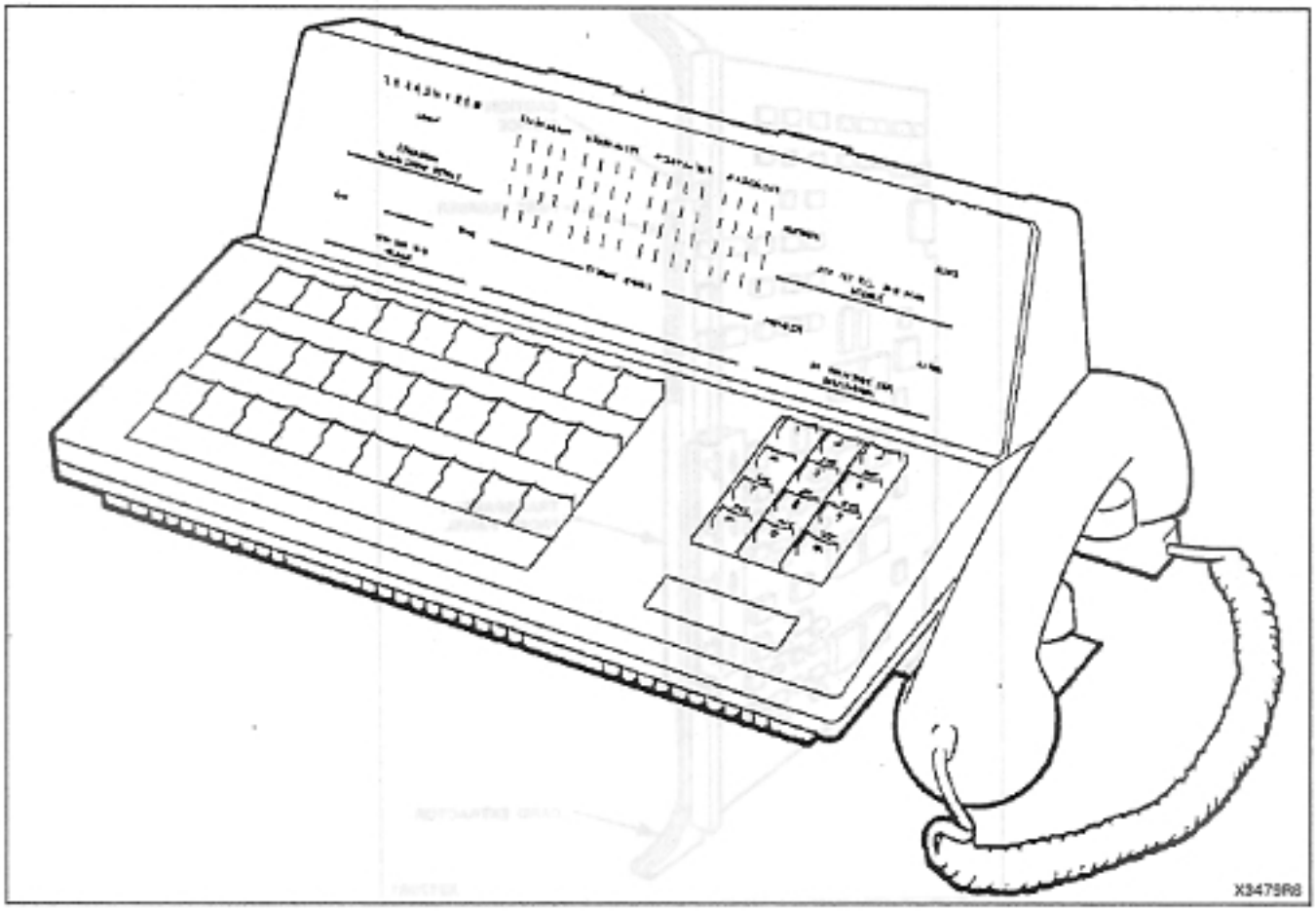


Figure 2-8 Supervisor Console

coded and held in card positions 18 through 20. These card positions are fixed for all systems.

3.06 The number of line, trunk, and receiver cards must be specified to fulfil the individual requirements of each customer. Each line card contains eight independent line circuits. Each trunk card contains two or four trunk circuits depending on the trunk type. The receiver card may contain two receiver circuits (dual type) or four receiver circuits (quad type). See Figure 3-2 which shows the maximum configurations of cards.

Equipment Shelf 2

3.07 To expand the SX-200 to its maximum capability a second equipment shelf must be employed. Equipment shelf 2 is identical in construction to shelf 1 and provides an additional 12 card positions, which may be used to house line or trunk cards. Card positions 13 through 22 on shelf 2 are not used.

Electrical Characteristics

3.08 The ACD systems are designed to operate from a 48 Vdc supply which is derived from either the commercial AC supply or a reserve battery supply. Table 3-1 details the electrical characteristics of the system.

3.09 For a description of the Features and Services of the ACD systems refer to Section MITL9105/9110-090-105-NA, Features and Services Description.

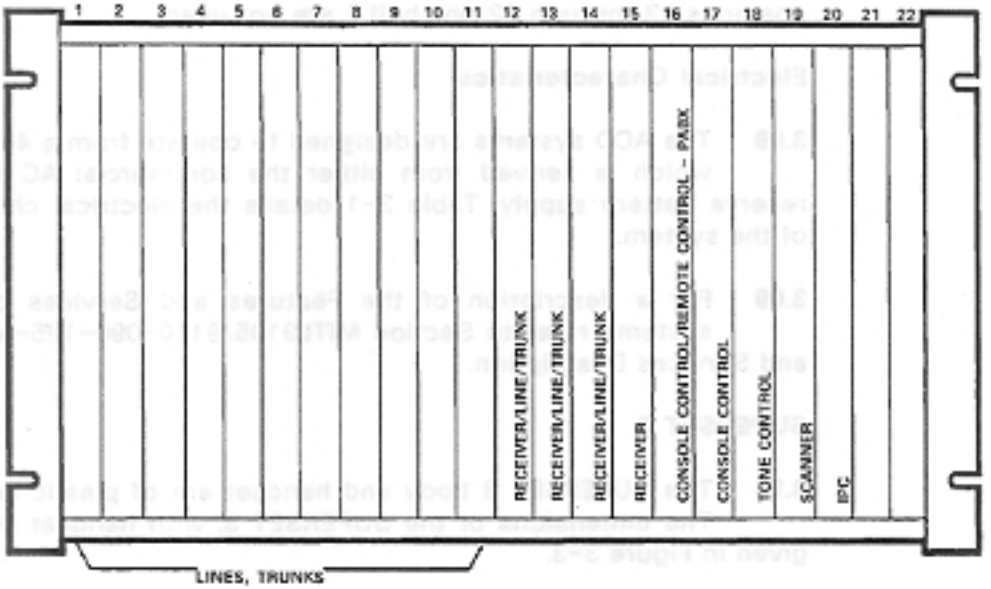
SUPERSET 3

3.10 The SUPERSET 3 body and handset are of plastic construction. The dimensions of the SUPERSET 3, with handset on-hook, are given in Figure 3-3.

3.11 The body and handset are interconnected via a modular detachable handset cord, plugged into the side of the body. Line connection to the set is by means of a modular detachable line cord, plugged into the rear of the set.

Body

3.12 The body of the SUPERSET 3 comprises two parts - a base assembly and a cover assembly (see Figure 3-4).

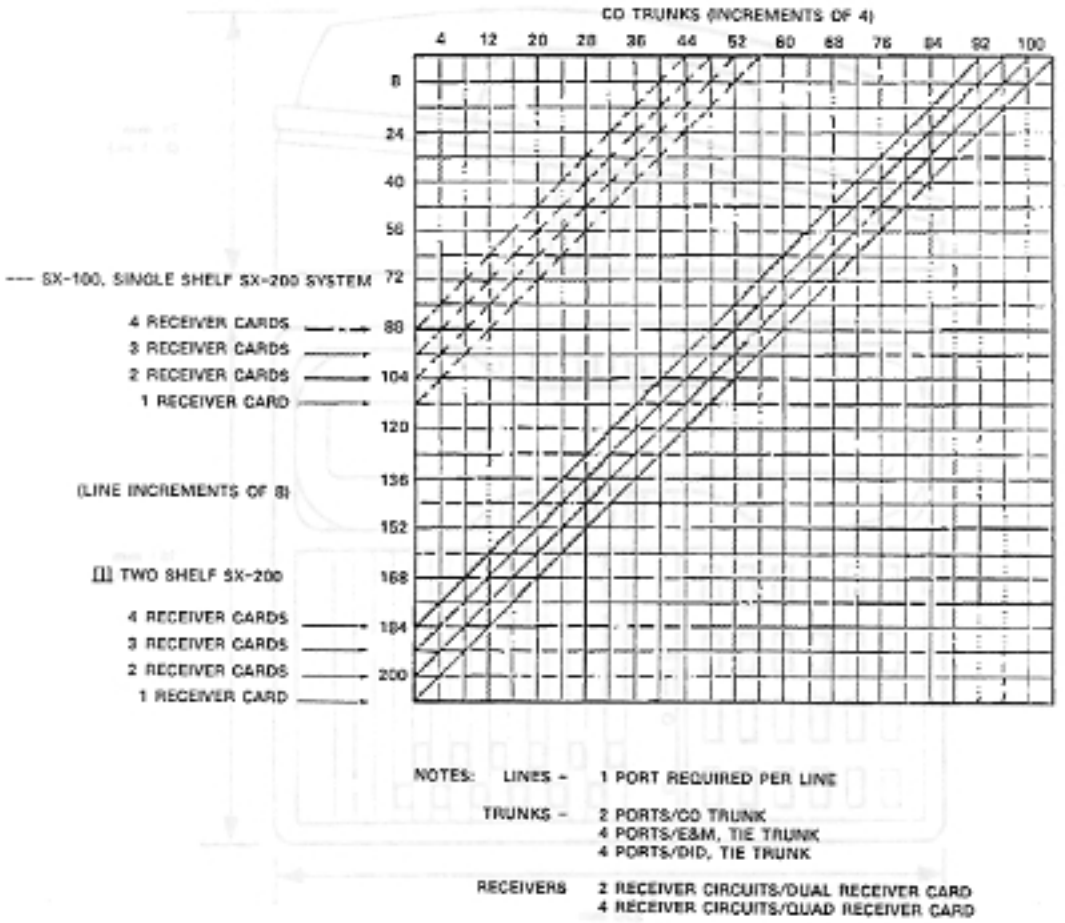


FRONT VIEW

SHELF 1

X5619

Figure 3-1 Equipment Shelf



NOTES: LINES – 1 PORT REQUIRED PER LINE

TRUNKS – 2 PORTS/CO TRUNK
4 PORTS/E&M, TIE TRUNK
4 PORTS/DID, TIE TRUNK

RECEIVERS 2 RECEIVER CIRCUITS/DUAL RECEIVER CARD
4 RECEIVER CIRCUITS/QUAD RECEIVER CARD

X02R4

Figure 3-2 Maximum Line and Trunk Configuration

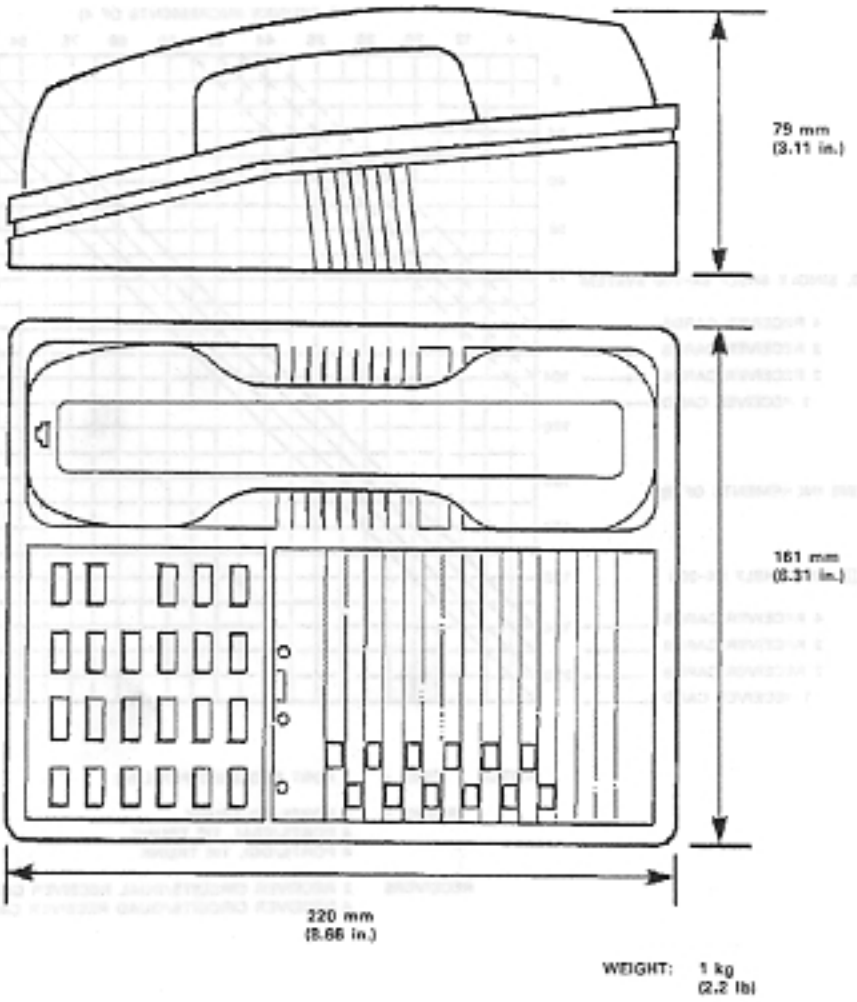


Figure 3-3 SUPERSET 3 Dimensions

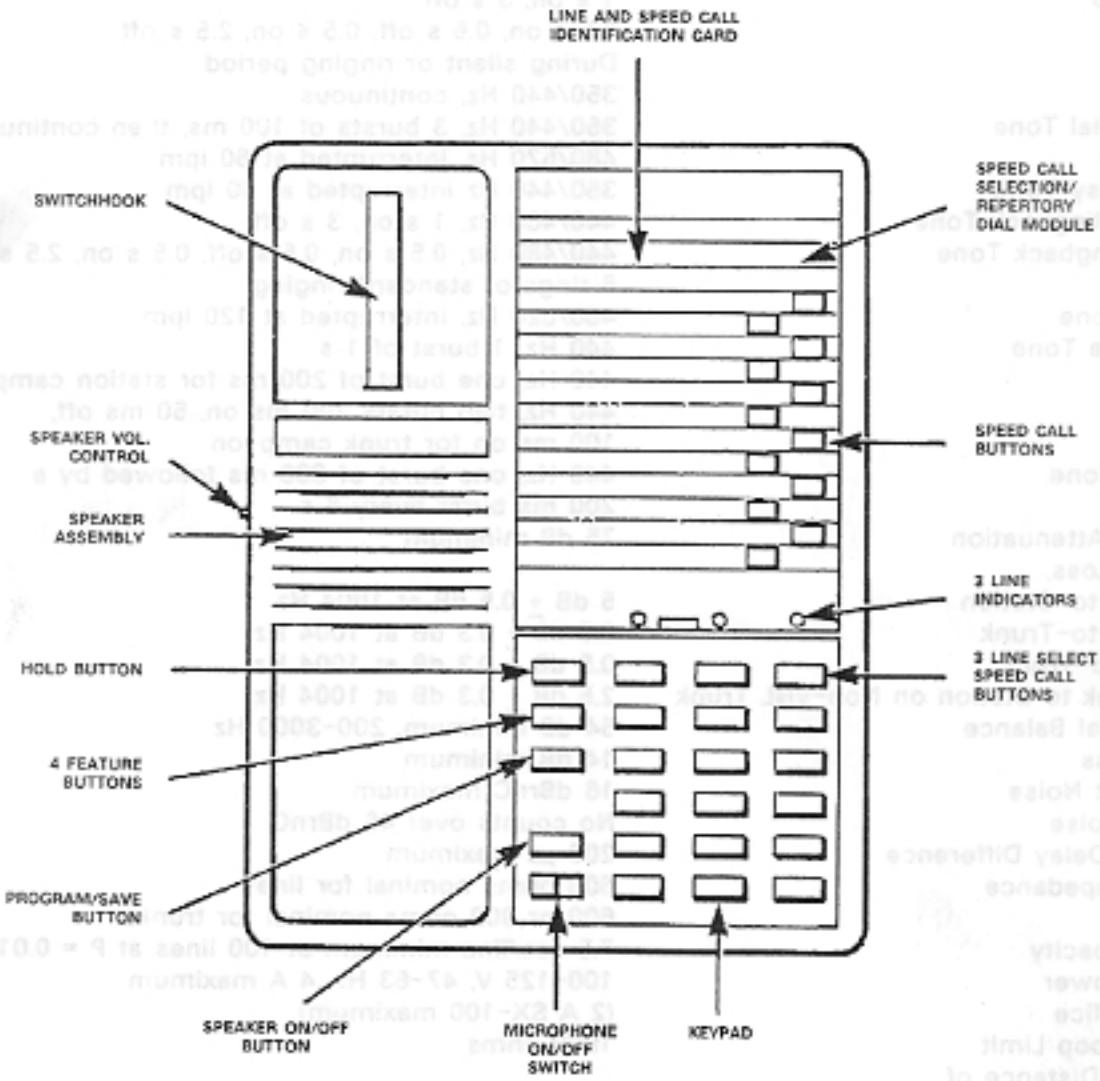


Figure 3-4 SUPERSET 3

TABLE 3-1
ELECTRICAL CHARACTERISTICS

R1

Station Loop Limit	1200 ohms including set
Maximum Number of Ringers per Line	5
Ringing	90 V, 20 Hz - immediate ringing (option of 17 Hz or 25 Hz)
Standard	1 s on, 3 s off
Special	0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
Ring Trip	During silent or ringing period
Dial Tone	350/440 Hz, continuous
Transfer Dial Tone	350/440 Hz, 3 bursts of 100 ms, then continuous
Busy Tone	480/620 Hz, interrupted at 60 ipm
Special Busy Tone	350/440 Hz interrupted at 60 ipm
Standard Ringback Tone	440/480 Hz, 1 s on, 3 s off
Special Ringback Tone	440/480 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
Callback	6 rings of standard ringing
Reorder Tone	480/620 Hz, interrupted at 120 ipm
Conference Tone	440 Hz, 1 burst of 1 s
Camp-On	440 Hz, one burst of 200 ms for station camp-on 440 Hz, two bursts 100 ms on, 50 ms off, 100 ms on for trunk camp-on
Override Tone	440 Hz, one burst of 800 ms followed by a 200 ms burst every 6 s
Crosstalk Attenuation	75 dB minimum
Insertion Loss,	
Station-to-Station	5 dB ± 0.5 dB at 1004 Hz
Station-to-Trunk	0.5 dB ± 0.3 dB at 1004 Hz
Trunk-to-Trunk	0.5 dB ± 0.3 dB at 1004 Hz
Tie Trunk to Station on Non-VNL Trunk	2.5 dB ± 0.3 dB at 1004 Hz
Longitudinal Balance	54 dB minimum, 200-3000 Hz
Return Loss	14 dB minimum
Idle Circuit Noise	16 dBrnC maximum
Impulse Noise	No counts over 46 dBrnC
Envelope Delay Difference	200 μs maximum
System Impedance	600 ohms nominal for lines 600 or 900 ohms nominal for trunks
Traffic Capacity	7.5 ccs/line minimum at 100 lines at P = 0.01
Primary Power	100-125 V, 47-63 Hz, 4 A maximum
Central Office	(2 A SX-100 maximum)
Trunk Loop Limit	1600 ohms
Maximum Distance of Console from Equipment	300 m (1000 ft) of 26 AWG cable
Operating Environment	0°C to 40°C (32°F to 104°F), 10% to 90% Relative Humidity
Maximum Number of SUPERSETs	64

Base Assembly

3.13 The base assembly contains a microphone (for hands-free operation), the switchhook, modular jacks for the handset and line cords, and a speaker assembly (for hands-free operation and tone ringer output). The microphone is mounted in a position permitting it to receive sound passing through in the front of the base assembly. The speaker is mounted between the handset recesses, and projects sound upwards through a grill beneath the handset.

3.14 A screwdriver slotted control for adjusting ringer pitch is user-accessible underneath the base assembly.

Cover Assembly

3.15 The cover assembly houses a keypad module, and a line selection/repertory dial module.

Volume Control Assembly

3.16 One volume control, for speaker and ringer, is mounted in the left-hand side of the cover assembly.

Keypad Module

3.17 The keypad module contains a standard 12-button keypad, one HOLD button, three LINE SELECT/SPEED CALL buttons, four FEATURE buttons, one PROGRAM/SAVE button, one SPEAKER ON/OFF button and one MICROPHONE ON/OFF switch.

Speed Call Selection/Repertory Dial Module

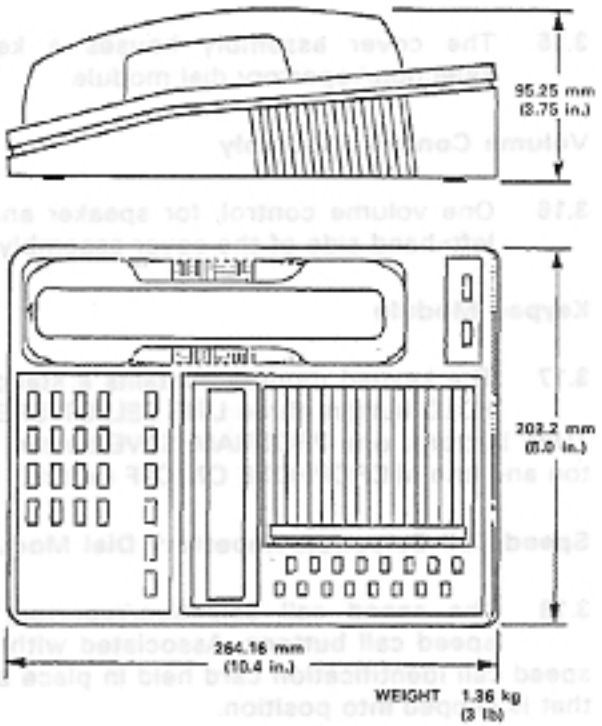
3.18 The speed call selection/repertory dial module contains 12 speed call buttons. Associated with the speed call buttons is a speed call identification card held in place by a transparent plastic lens that is clipped into position.

3.19 For a description of the SUPERSET 3 Features and Services, refer to Section MITL9105/9110-090-106-NA, Features and Services Description.

SUPERSET 4

3.20 The SUPERSET 4 body and handset are of plastic construction. The dimensions of the SUPERSET 4, with handset on-hook, are given in Figure 3-5.

3.21 The body and handset are interconnected via a modular detachable handset cord, plugged into the side of the body. Line connection to the set is by means of a modular detachable line cord, plugged into the rear of the set.



X5501AD

Fig. 3-5 SUPERSET 4 Dimensions

3.22 A rear support can be clipped in position beneath the set. This would be used when the set is likely to be placed some distance from the user.

Body

3.23 The body of the SUPERSET 4 comprises two parts – a base assembly and a cover assembly (see Figure 3-6).

Base Assembly

3.24 The base assembly contains a microphone (for hands-free operation), the switchhook, modular jacks for the handset and line cords, and a speaker assembly (for hands-free operation and tone ringer output). The microphone is mounted in a position permitting it to receive sound passing through an aperture in the front of the base assembly. The speaker is mounted between the handset recesses, and projects sound upwards through a grill beneath the handset.

3.25 A screwdriver slotted control for adjusting ringer pitch is user-accessible underneath the base assembly.

Cover Assembly

3.26 The cover assembly houses a volume control assembly, a keypad module, and a line selection/repertory dial module.

Volume Control Assembly

3.27 Two volume controls, one each for speaker and ringer, are mounted in the upper left-hand corner of the cover assembly. The controls are edge-mounted and are identified with a printed card insert. This card also has space for the installation telephone number, and is held in place by a transparent plastic lens that is clipped in position.

Keypad Module

3.28 The keypad module contains a standard 12-button keypad, six feature buttons, and four supplementary feature buttons.

Line Selection/Repertory Dial Module

3.29 The line selection repertory dial module contains 15 line select/speed call buttons, a hold button, an LCD line status display, and an LCD feature display.

3.30 Associated with the buttons and the line status display is a line identification card. This card identifies the primary line (extension) and hold buttons, and provides space for function identification (i.e., line and speed call identities) of the remaining buttons. The card is held in place with a transparent plastic lens that is clipped in position.

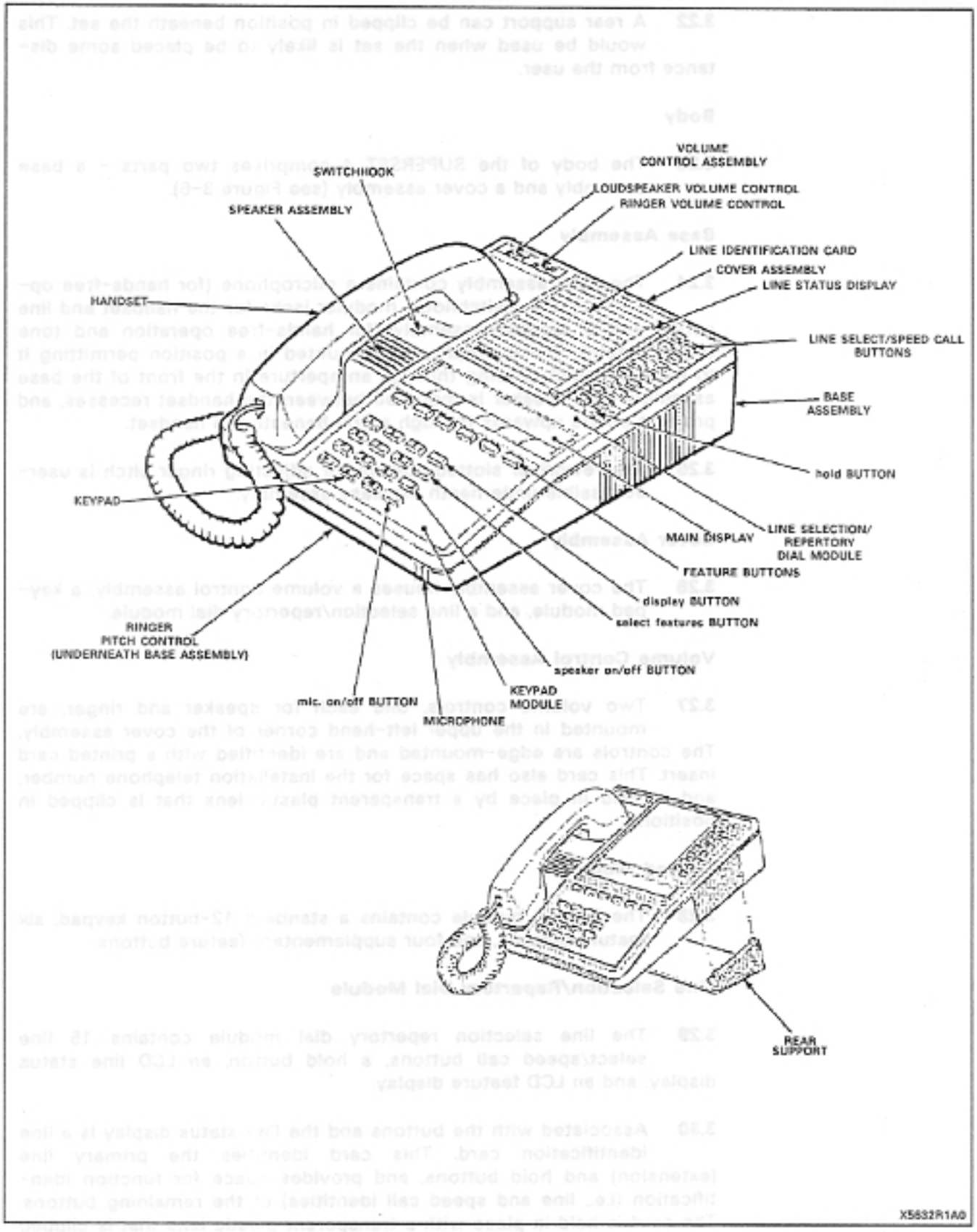


Figure 3-6 SUPERSET 4

3.31 For a description of the SUPERSET 4 Features and Services refer to Section MITL9105/9110-090-107-NA, Features and Services Description.

TABLE 4-1
ORDERING TABLE

Table	Name
4-2	Basic Systems
4-3	Generic Features Packages
4-4	Common Control Cards
4-5	Interface Cards
4-6	Power Supply Equipment
4-7	Console and SUPERSETs
4-8	Miscellaneous Spares
4-9	Accessories
4-10	RMATS
4-11	System Documentation
4-12	Map Documentation
4-13	RMAT Documentation
4-14	SUPERSET 4 Documentation
4-15	Miscellaneous Documentation

4. ORDERING INFORMATION

General

4.01 The following information is provided for ease of ordering SX-100 or SX-200 equipment. Table 4-1 lists all tables in this Part and their relation to ordering information.

Systems

4.02 Basic systems are provided as per Table 4-2. The following paragraphs will deal with miscellaneous cards other than common control cards. (Common control cards are discussed in Table 4-4.)

Line Cards

4.03 This line card is for standard telephone sets only. This line card cannot be used with SUPERSET 4.

$$\text{Number of line cards} = \frac{\text{number of extensions}}{8}$$

Subscriber Line Interface Card (SLIC)

4.04 A SLIC can provide service for a maximum of eight SUPERSET 4s. Standard telephone sets cannot be connected to a SLIC. To order SLICs consult the following table:

SLIC REQUIREMENTS

Number of SUPERSETs	Number of SLICs
1-8	1
9-16	2
17-24	3
25-32	4
33-40	5
41-48	6
49-56	7
57-64	8

CO Trunk Cards

4.05 The number of CO trunk cards =

$$\frac{\text{no. of CO trunks + no. of misc CO type trunks}}{4}$$

E&M Trunk Cards

4.06 The number of E&M trunk cards =

$$\frac{\text{number of E\&M type trunks}}{2}$$

DID/TIE Trunk Cards

4.07 The number of DID/TIE trunk cards =

$$\frac{\text{number of DID/TIE trunks}}{2}$$

Receiver Cards

4.08 Order one dual receiver per 40 extensions. For extensions over 40 but under 80, order one quad receiver. For over 80 but under 120 extensions, order one dual and one quad card. In excess of 120 extensions, order two quad receivers. For a detailed calculation of the number of receiver cards required, see Section MITL9105/9110-090-180-NA.

Console

4.09 Order one console control card (maximum two) for each console used (maximum two) excluding the Maintenance Console for this calculation. A maximum of two Supervisor Consoles and one Maintenance Console may be used with an SX-100 or SX-200 (see Table 4-7).

SUPERSET 3 and SUPERSET 4

4.10 The SUPERSET ordering information is contained in Table 4-7.

TABLE 4-2
BASIC SYSTEMS

Basic System	Consists of:	Ordering Number
SX-100 110 Vac	Equipment Cabinet Maintenance (PFT) Panel, Power Supply (110 Vac), Power Fail Transfer/Interconnect/Console Interface Card, Equipment Shelf, Antistatic Wrist Strap	9106-000-001-NA
SX-100 220 Vac	Equipment Cabinet, Maintenance (PFT) Panel, Power Supply (220 Vac), Power Fail Transfer/Interconnect/Console Interface Card, Equipment Shelf, Antistatic Wrist Strap	9106-000-002-NA
SX-200 110 Vac	Equipment Cabinet, Maintenance Panel (PFT), Power Supply (110 Vac), Power Fail Transfer Card, Interconnect Card, Console Interface Card, Shelf Interconnect Cables, Equipment Shelf (one), Antistatic Wrist Strap	9110-000-001-NA
SX-200 220 Vac	Equipment Cabinet Maintenance Panel (PFT), Power Supply (220 Vac), Power Fail Transfer Card, Interconnect Card Console Interface Card, Shelf Interconnect Cables, Equipment Shelf (one), Antistatic Wrist Strap	9110-000-002-NA

Miscellaneous

4.11 Other miscellaneous cards and equipment are available, see Table 4-8.

Order Basic System Components

4.12 To order a basic system refer to Table 4-2.

Generic Feature Package

4.13 Refer to Table 2-1 and Table 4-3 to order the correct IPC card.

TABLE 4-3
GENERIC FEATURE PACKAGE

Generic	Card	Ordering Number
ACD	One IPC	9110-418-ACD-NA

Common Control Cards

4.14 See Table 4-4 to order Common Control Cards.

TABLE 4-4
COMMON CONTROL CARDS

Card	Ordering Number	Quantity
IPC	9110-203-ACD-NA	1
Scanner	9110-104-000-NA	1
Tone Control	9110-005-000-NA	1
Console Control (Note 1)	9100-006-000-NA	1 per console
Control (Note 1)		
Receiver Dual	9110-016-003-NA (see 4.08)	
Receiver Quad	9110-016-000-NA (see 4.08)	

Note: Do not count maintenance console when ordering more than one console control card.

Interface Cards

4.15 To order a sufficient quantity of interface cards see 4.02 through 4.07.

TABLE 4-5
INTERFACE CARDS

Card	Ordering Number
Superset Line Circuit	9110-410-000-NA
Line Circuit	9110-110-000-NA
Remote Control-PABX	9110-017-000-NA
E&M Trunk Circuit	9110-013-000-NA
DID/TIE Trunk Circuit	9110-031-000-NA
Remote Control-Central	9110-117-000-NA
CO-Trunk Circuit	9110-211-000-NA
Recorded Announcement Card (1 Module)	9110-072-001-NA
Recorded Announcement Card (2 Modules)	9110-072-000-NA
Recorded Announcement Module	9110-073-000-NA

Power Supply Equipment

4.16 To order power supply equipment consult Table 4-6.

TABLE 4-6
POWER SUPPLY EQUIPMENT

Equipment	Ordering Number
SX-100 Power Supply 110 Vac	9105-008-000-NA
SX-100 Reserve Power 110/220 Vac	9105-014-002-NA
SX-100 Reserve Power 110 Vac	9105-014-003-NA
SX-100 Main Distribution Cable	9105-027-000-NA
SX-100/SX-200 Fuse Kit	9110-076-000-NA
SX-100/SX-200 Charger 110 Vac	9110-114-000-NA
SX-100/SX-200 Charger 220 Vac	9110-314-000-NA
SX-200 Reserve Power 110 Vac	9110-014-000-NA
SX-200 Reserve Power 220 Vac	9110-014-001-NA
SX-200 Reserve Power 110/220 Vac	9110-014-003-NA
SX-200 Intershelf Surge Protector	9110-066-000-NA
SX-200 Power Supply 110 Vac	9110-108-000-NA
SX-200 Main Distribution Cable	9110-127-000-NA
SX-200 Heat Sink	9110-144-000-NA
SX-200 Power Supply 220 V (20 Hz 90 Vac)	9110-208-000-NA

Consoles and SUPERSETs

4.17 To order a console or SUPERSET 4 consult Table 4-7.

TABLE 4-7
CONSOLES AND SUPERSETs

Equipment	Ordering Number
SX-100/SX-200 Console (Includes 1 Black Handset)	9110-107-000-NA
SX-200 Console Interface Card	9110-045-000-NA
Console Handset Black	9110-148-000-NA
Console Graphic Panel	9110-053-002-NA
Display Repair Kit	9110-078-000-NA
SUPERSET 3	9173-000-001-NA
SUPERSET 4	9174-000-001-NA
SUPERSET 4 Elevation Stand	9174-001-000-NA
SUPERSET 4 Lens Kit	9174-002-000-NA
SUPERSET 4 Labels Kit	9174-002-001-NA
Modular Handset Peb/Blk	9170-048-000-NA
Handset Cord Blk	9170-048-001-NA

Miscellaneous

4.18 To order miscellaneous components consult Table 4-8.

TABLE 4-8
MISCELLANEOUS SPARES

Equipment	Ordering Number
SX-100 PFT/Interconnect	9105-023-000-NA
SX-100 Maintenance Panel	9105-025-000-NA
SX-100 Power Distribution Cable	9105-027-000-NA
SX-100 Wall-mount Unit	9105-038-000-NA
SX-100 Wall-mount Hardware Kit	9105-038-001-NA
SX-100 220 V Adapter	9105-037-000-NA
SX-100 Cabinet	9105-001-000-NA
SX-100 PFT/Interconnect	9105-123-000-NA
SX-100 Interconnect Cable	9105-023-000-NA
RS232 Adapter (Null Modem)	9110-052-000-NA
Two Shelf Buffer Kit	9110-066-000-NA
Antistatic Wrist Strap	9110-079-000-NA
Backplane Translator	9110-046-000-NA
Equipment Shelf	9110-112-000-NA
Battery pack	9110-214-000-NA
SX-200 Maintenance Panel	9110-125-000-NA
SX-200 Maintenance Panel	9110-025-000-NA
SX-200 Interconnect Cable	9110-124-000-NA
SX-200 Shelf Interconnect CABLES	9110-026-000-NA
RAM Battery Pack	9110-020-000-NA
IPC RAM Module	9110-063-000-NA

Accessories

4.19 To order accessories consult Table 4-9.

TABLE 4-9
ACCESSORIES

Equipment	Part Number
Data Demultiplexer	9160-000-001-NA
DART	9162-001-001-NA

RMATS

4.20 To order RMATS consult Tables 4-10 and 4-11 (RMAT Documentation).

TABLE 4-10
RMATS

Generic	Card	Ordering Number
290 PROM/CPU	AND RMATS Remote	9110-218-290-NA
Generic 290	Control-Central	
RMATS Remote Card	Remote Control PABX	9110-017-000-NA

Documentation

4.21 To order documentation refer to Tables 4-11 - 4-15.

TABLE 4-11
SYSTEM DOCUMENTATION

R1R2

Documentation	Ordering Number
Complete ACD System Documentation	9110-035-010-NA
System Documentation	9110-032-001-NA
Console Documentation	9110-137-000-NA
Agent Guide	9110-953-020-NA
Supervisor Manual	9110-953-021-NA
ACD System Documentation	9110-032-010-NA

Documentation	Ordering Number
ACD System Documentation	9110-032-010-NA
Volume I	9110-090-001-NA
Volume II	9110-090-002-NA
Volume III	9110-090-003-NA
Volume IV	9110-090-004-NA
Warranty Card	9110-959-001-NA
Personal Speed Call Directory	9110-059-001-NA

Documentation	Ordering Number
Supervisor Console Documentation	9110-137-100-NA
Console Book	1910-217-137-002-NA
Console Designation Strips (Comm/Hotel/Programming)	1910-137-005-NA
Console Designation Strips (Optional)	1910-137-006-NA
Overlay Booklet	1910-137-002-NA
Sheet Definitions	1910-037-008-NA
Sheet Alarm Definitions	1910-037-009-NA
Sheet Faulty Circuits and Alarms	1910-037-010-NA
2 Sheet Black Number Field	1910-137-003-NA
2 Sheet Black Number Field	1910-137-004-NA
4 Sheet Speed Call Records	1910-037-012-NA
Repair Tag	9110-098-018-NA

Documentation	Ordering Number
System Documentation	9110-090-001-NA
Documentation Index	9105/9110-090-000-NA
SX-100 General Description	9105/9110-090-100-NA
SX-200 General Description	9105/9110-090-100-NA
Feature and Services Description	9105/9110-090-105-NA
SX-100/SX-200 Order Information	9105/9110-090-150-NA
Engineering Information	9105/9110-090-180-NA
Multi Digit Toll Control	9105/9110-090-212-NA
Automatic Route Selection	9105/9110-090-213-NA
Speed Call	9105/9110-090-220-NA
Console Description	9105/9110-090-315-NA
Traffic Measurement	9105/9110-090-415-NA
Station Message Detail Recording	9105/9110-090-451-NA
General Maintenance	9105/9110-090-500-NA

Documentation	Ordering Number
System Documentation - Volume III Installation Forms	9110-090-003-NA
System Documentation - Volume II	9110-090-002-NA
Documentation Index	9105/9110-090-000-NA
Installation Information	9105/9110-090-200-NA
Installation Forms	9105/9110-090-205-NA
Programming Practice	9105/9110-090-210-NA
Installation Test Procedures	9105/9110-090-215-NA
Extension Test Procedures	9105/9110-090-320-NA
System Documentation - Volume IV	9110-090-004-NA
Troubleshooting	9105/9110-090-350-NA

TABLE 4-12
MAP DOCUMENTATION

Title	Map Number	Part Number
Set CO Trunk Switches	MAP200-501	1910-200-501-NA
Set E&M Trunk Switches	MAP200-502	1910-200-502-NA
Set DID Trunk Switches	MAP200-503	1910-200-503-NA
Set Scanner Card Switches	MAP200-504	1910-200-504-NA
Set CO Trunk Switches	MAP200-504	1910-200-504-NA (Type 211-000/311-000)
Set IPC Switches	MAP200-507	1910-200-507-NA
SUPERSET 3/4 Installation	MAP200-509	1910-200-509-NA
Shelf 2 Installation	MAP200-601	1910-200-601-NA
Install New Cards	MAP200-602	1910-200-602-NA
Reserve Power Supply Installation	MAP200-603	1910-200-603-NA
Console Interface Board Installation	MAP200-604	1910-200-604-NA
Backplane Translator Board Installation	MAP200-605	1910-200-605-NA
Installation of RCP Card	MAP200-606	1910-200-606-NA
SX-100 Reserve Power Supply Installation	MAP200-607	1910-200-607-NA
Printer Installation	MAP200-608	1910-200-608-NA
Static Ground Strap Installation	MAP200-609	1910-200-609-NA
Dump and Load	MAP200-610	1910-200-610-NA
Recorded Announcement Card	MAP200-611	1910-200-611-NA
Replace Interconnect Card	MAP350-502	1910-350-502-NA
Replace Power Fail Transfer Card	MAP350-503	1910-350-503-NA
Replace Console Interface Card	MAP350-504	1910-350-504-NA
Replace Shelf	MAP350-505	1910-350-505-NA
Replace Heat Sink Assembly	MAP350-506	1910-350-506-NA
Replace Power Supply Assembly	MAP350-507	1910-350-507-NA
Replace Reserve Power Supply	MAP350-508	1910-350-508-NA
Replace Translator Board	MAP350-509	1910-350-509-NA
Replace Shelf Cards	MAP350-510	1910-350-510-NA
Replace Maintenance Panel	MAP350-511	1910-350-511-NA
Replace Wiring Harness	MAP350-512	1910-350-512-NA

TABLE 4-13
RMAT DOCUMENTATION

Title	Part Number
RMAT Documentation consisting of:	9110-058-000-NA
RMAT General Description	9110-098-101-NA
RMAT Operation Practice	9110-098-401-NA
Console RMAT Overlay	1910-137-009-NA (200 Busy Lamps)
Console RMAT Key Tabs	1910-037-004-NA
Console RMAT Overlay	1910-037-007-NA (150 Busy Lamps)

TABLE 4-14
SUPERSET 4 DOCUMENTATION

Description	Part Number
SUPERSET 3 Reference Guide	9173-953-001-NA
SUPERSET 4 Reference Guide	9174-953-001-NA

TABLE 4-15
MISCELLANEOUS DOCUMENTATION

Documentation	Part Number
Pocket Reference Guide	9174-953-000-NA
Data Demultiplexer	9160-080-001-NA
DART Reference Guide	9162-953-001-NA
DART Technical Manual	9162-953-002-NA

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

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1. GENERAL

Introduction

1.01 This Section provides engineering information for the SX-100 and SX-200 Automatic Call Distribution (ACD) Systems.

Reason for Issue

1.02 This Section has been issued to detail the Generic ACD Engineering Information.

2. SYSTEM OVERVIEW

General

2.01 The SX-100 and SX-200 are advanced electronic ACDs employing digitally controlled solid-state, space-division switching with stored-program control. The capacities of the ACDs are as follows:

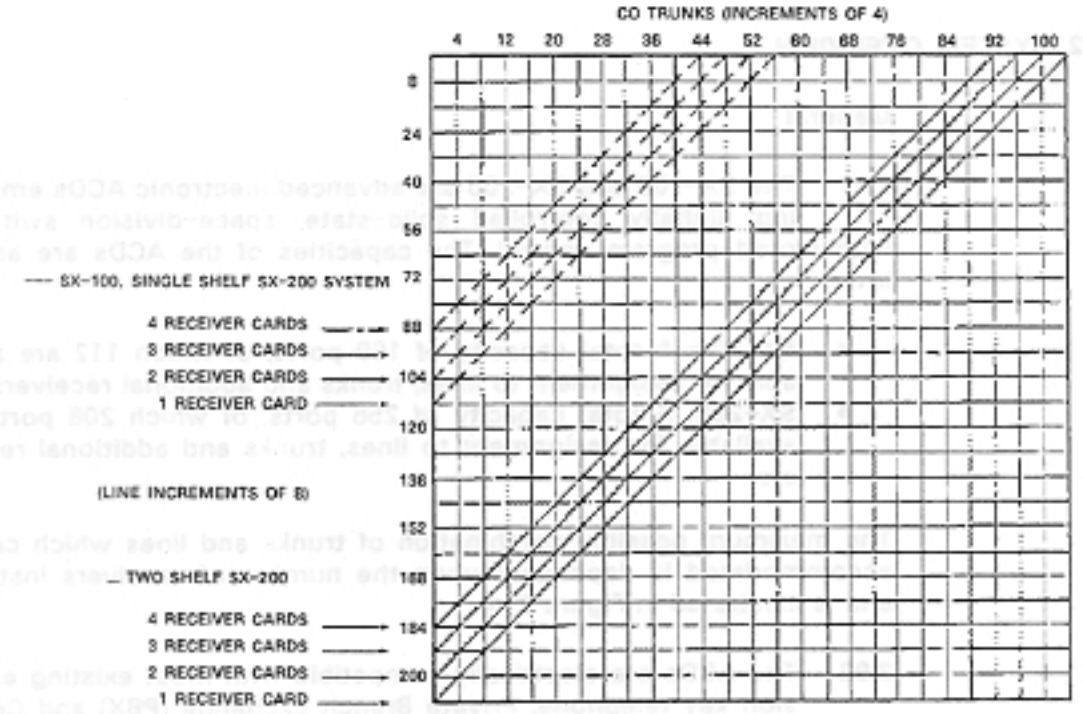
- **SX-100:** A total capacity of 160 ports, of which 112 are available for assignment to lines, trunks and additional receivers.
- **SX-200:** A total capacity of 256 ports, of which 208 ports are available for assignment to lines, trunks and additional receivers.

The maximum possible combination of trunks and lines which can be accommodated is dependent upon the number of receivers installed, and is illustrated in Figure 2-1.

2.02 The ACDs are electrically compatible with most existing extension key telephone, Private Branch Exchange (PBX) and Central Office (CO) equipment, and provide:

- The use of a flexible numbering plan.
- The simultaneous use of DTMF and rotary dial (RD) stations.
- Optional use of supervisor consoles – two maximum.
- Extensive selection of standard and optional features.
- Freedom from scheduled maintenance.
- Automatic diagnostics.
- Six power fail transfer circuits (SX-100).
- Twelve power fail transfer circuits (SX-200).
- Optional reserve power supply.
- The use of SUPERSET 3 and SUPERSET 4 electronic telephone sets.

2.03 The SX-100 consists of a single cabinet (containing the switching circuitry and the system power supply) and a desk-type supervisor console equipped with pushbutton dial pad and control keys. The equipment may optionally be supplied as a cabinet with a wall-mounting assembly (refer to Part 3).



NOTES: LINES – 1 PORT REQUIRED PER LINE

TRUNKS – 2 PORTS/CO TRUNK
4 PORTS/E&M, TIE TRUNK
4 PORTS/DID, TIE TRUNK

RECEIVERS 2 RECEIVER CIRCUITS/DUAL RECEIVER CARD
4 RECEIVER CIRCUITS/QUAD RECEIVER CARD

X02R4

Figure 2-1 Maximum Line and Trunk Configuration

2.04 The SX-200 consists of a single cabinet (containing the switching circuitry and the system power supply) and a desk-type supervisor console equipped with pushbutton dial pad and control buttons.

2.05 Connections between the equipment, the consoles and the distribution frame are made using connectorized 25-pair cables.

2.06 Noiseless operation, exceptionally small size and environmental tolerance allow a wide choice of locations for the equipment.

Maintenance

2.07 The modular design and functional packaging of the equipment systems permit rapid location and replacement of defective equipment. Circuit malfunctions are detected by diagnostic routines automatically initiated by the CPU. These circuit malfunctions will appear in the console's SOURCE or DESTINATION display when the ALARM RESET is pressed. The diagnostic routines which are detailed in Section MITL9105/9110-090-500-NA, General Maintenance Information, and the use of Section MITL9105/9110-090-350-NA, Troubleshooting Manual, direct service personnel to the defective circuit card or assembly, and indicate the required field-replaceable unit. Diagnostic routines and maintenance procedures do not interfere with users not affected by the malfunction.

2.08 System expansion is achieved by the addition of plug-in line and trunk printed circuit cards. Lines are added in increments of eight, CO trunks in increments of four and Tie trunks in increments of two.

3. PHYSICAL DESCRIPTION

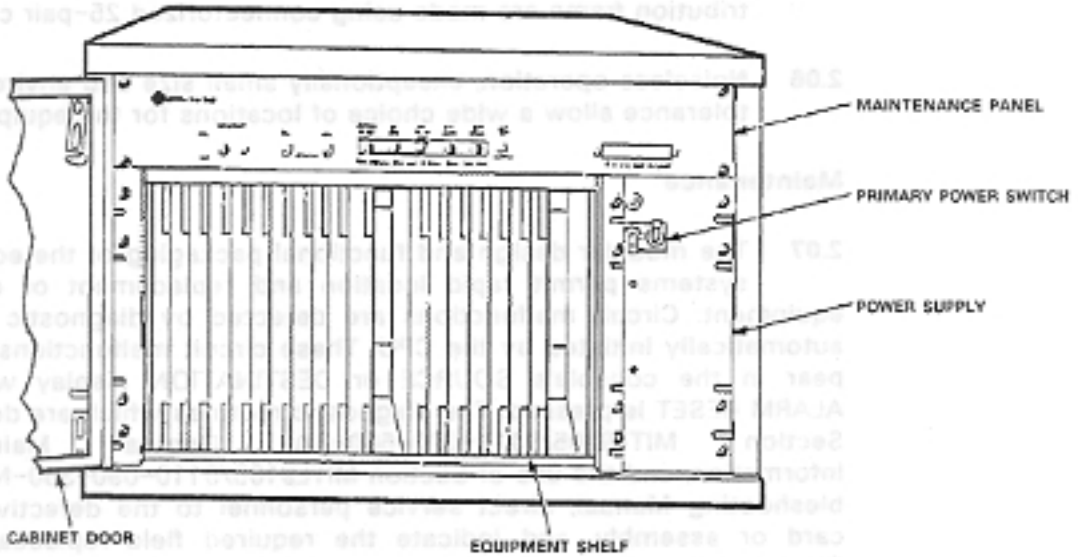
A. SX-100 Equipment

3.01 The SX-100 equipment can be supplied in one of two versions: As a complete cabinet intended for mounting on a pedestal or table. As a cabinet which, with the addition of a wall-mount kit, can be mounted on a wall.

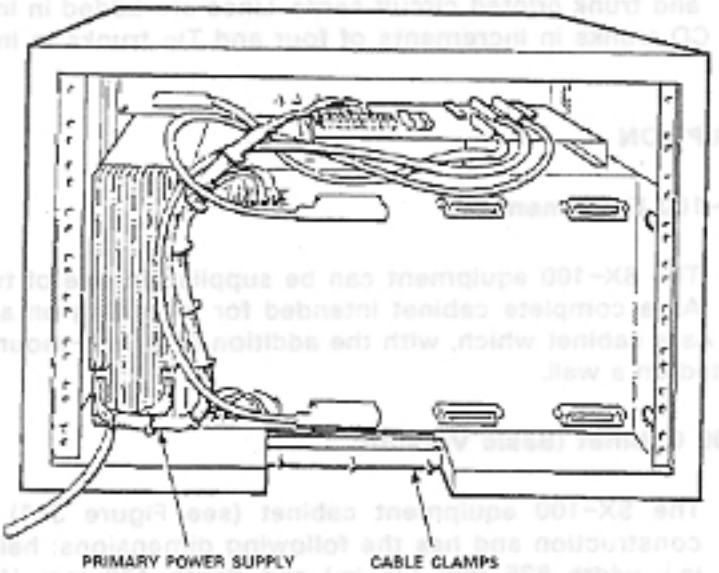
SX-100 Cabinet (Basic Version)

3.02 The SX-100 equipment cabinet (see Figure 3-1) is of metal construction and has the following dimensions: height 422 mm (16.62 in.), width 635 mm (25 in.) and depth 470 mm (18.5 in.). The weight of a fully equipped ACD system is approximately 31.8 kg (70 lb).

3.03 All connections from the cross-connecting terminals to the SX-100 equipment cabinet are made using connectorized cables. Connections between the cross-connecting terminals, the supervisor console and external equipment are made in accordance with accepted practice.



FRONT VIEW



REAR VIEW

WEIGHT	HEIGHT	WIDTH	DEPTH
(70 lb) 31.8 kg	(16.62 in.) 422 mm	(25.0 in.) 635 mm	(18.5 in.) 470 mm

X5611

Figure 3-1 SX-100 Equipment Cabinet

3.04 The door on the front of the cabinet provides access to the system maintenance panel and the printed circuit cards. The removable rear panel provides access to the system power supply, and the line and trunk connections. Cable entry to the equipment cabinet is provided through a cable duct in the rear of the cabinet.

Cabinet Components

3.05 The equipment cabinet holds the maintenance panel, an equipment shelf and the primary power supply.

Maintenance Panel

3.06 The maintenance panel, mounted at the top of the cabinet, provides access to the system from the maintenance console through a 50-pin connector. To the left of the maintenance plug is the master power fail switch and five power fail transfer control switches. In addition, a test line is provided which allows service personnel to access individual lines and trunks.

Equipment Shelf

3.07 Mounted directly below the maintenance panel is the equipment shelf. This shelf contains the system control logic plus a number of trunk, line and receiver cards. All connections between shelves and external equipment are made by connectorized cables from the rear of the shelf. The system primary power supply, located to the right of the equipment shelf, converts the commercial input power to the required system voltage levels.

3.08 The equipment shelf holds up to 20 printed circuit cards (see paragraph 3.21) which plug into the shelf backplane. On the rear of the backplane are a number of multipin plugs providing interconnections between the shelves and external equipment. In addition to the plugs are a number of screw-down terminals, allowing shelf connection to the primary power supply unit. The equipment shelf (see Figure 3-5) measures 273 mm (10.75 in.) high, 480 mm (19 in.) wide, 415 mm (16.375 in.) deep and weighs approximately 12.3 kg (27 lb) fully equipped.

Primary Power Supply

3.09 The system primary power supply mounted to the right of the equipment shelf (total weight 7.3 kg (16 lb)) provides all system power from a 115 Vac (optionally 230 Vac), 44 Hz to 64 Hz commercial supply.

SX-100 Cabinet (Wall-mount Version)

3.10 The SX-100 cabinet can be mounted on a wall surface by means of a wall-mount kit. Strikes and pivot pins, which form part of the kit, are attached to the cabinet (see Figure 3-2) which allows the cabinet to be securely fastened to the wall-mount assem-

bly. This method of attachment allows the cabinet to be swung down for installation and maintenance purposes.

Reserve Power Supply

3.11 The reserve power supply is designed to maintain complete system operation for a minimum of two hours, in the event of a primary power failure. The reserve power supply is housed in a completely enclosed unit and forms a base unit on which the standard SX-100 cabinet can be mounted. A cable harness is supplied to interconnect the two units. In the case of the wall-mounted version of the SX-100, the reserve power supply may be installed adjacent to the SX-100.

B. SX-200 Equipment

General

3.12 The SX-200 equipment cabinet (see Figure 3-3) is of metal construction and has the following dimensions: height 965 mm (38 in.), width 600 mm (23.5 in.) and depth 700 mm (27.5 in.). The weight of a fully equipped ACD is approximately 131.7 kg (290 lb).

3.13 All connections from the cross-connecting terminals to the SX-200 equipment cabinet are made using connectorized cables. Connections between the cross-connecting terminals, the supervisor console and external equipment are made in accordance with accepted practice.

3.14 A reserve power supply and battery charging system are available as an option. The reserve power supply is designed to maintain system operation for a minimum of two hours in the event of a primary power failure.

SX-200 Equipment Cabinet

3.15 The door on the front of the cabinet provides access to the system maintenance panel, printed circuit cards and reserve battery supply shelf. The hinged rear panels hold the system power supply, and provides access to the line and trunk connections, and the reserve power controls. Cable entry to the equipment cabinet is provided through cable ducts on either side of the cabinet.

3.16 The maintenance panel, mounted at the top of the cabinet, provides access to the system from the maintenance console through a 50-pin connector. To the left of the maintenance connector is the master power fail switch and five power fail transfer control switches. In addition, a test line is provided which allows service personnel to make calls and to access special maintenance functions. Mounted directly below the maintenance panel is equipment shelf 2. This shelf holds up to 12 line and/or trunk cards. Below equipment shelf 2 is equipment shelf 1. This shelf contains the system common control cards plus a number of trunk, line and receiver cards. The optional reserve power supply is contained in a completely enclosed

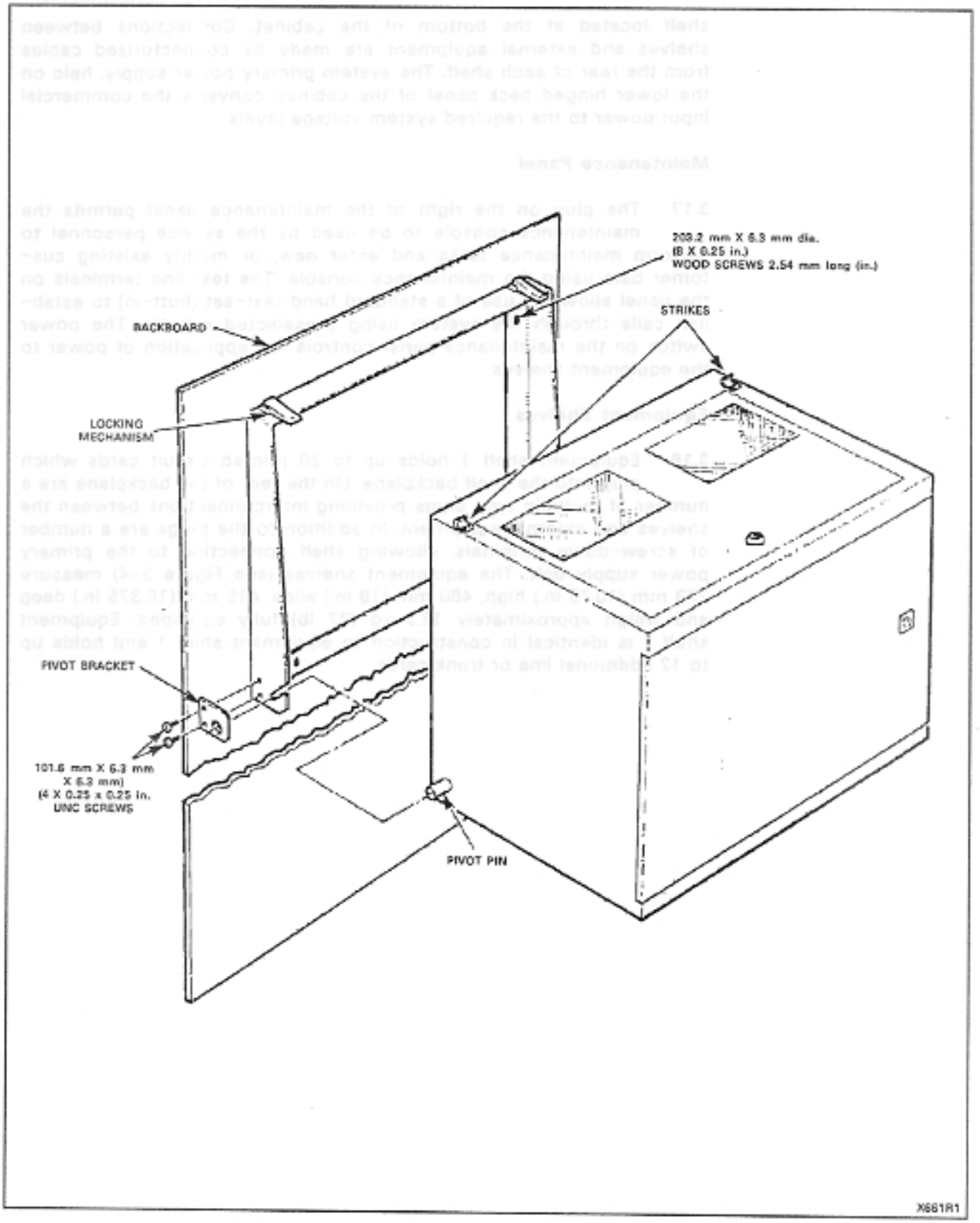


Figure 3-2 SX-100 Cabinet (Wall-mount Version)

shelf located at the bottom of the cabinet. Connections between shelves and external equipment are made by connectorized cables from the rear of each shelf. The system primary power supply, held on the lower hinged back panel of the cabinet, converts the commercial input power to the required system voltage levels.

Maintenance Panel

3.17 The plug on the right of the maintenance panel permits the maintenance console to be used by the service personnel to perform maintenance tasks and enter new, or modify existing customer data using the maintenance console. The test line terminals on the panel allow the use of a standard hand test-set (butt-in) to establish calls through the system using preselected circuits. The power switch on the maintenance panel controls the application of power to the equipment shelves.

Equipment Shelves

3.18 Equipment shelf 1 holds up to 20 printed circuit cards which plug into the shelf backplane. On the rear of the backplane are a number of multipin type plugs providing interconnections between the shelves and external equipment. In addition to the plugs are a number of screw-down terminals, allowing shelf connection to the primary power supply unit. The equipment shelves (see Figure 3-4) measure 273 mm (10.75 in.) high, 480 mm (19 in.) wide, 415 mm (16.375 in.) deep and weigh approximately 12.3 kg (27 lb) fully equipped. Equipment shelf 2 is identical in construction to equipment shelf 1 and holds up to 12 additional line or trunk cards.

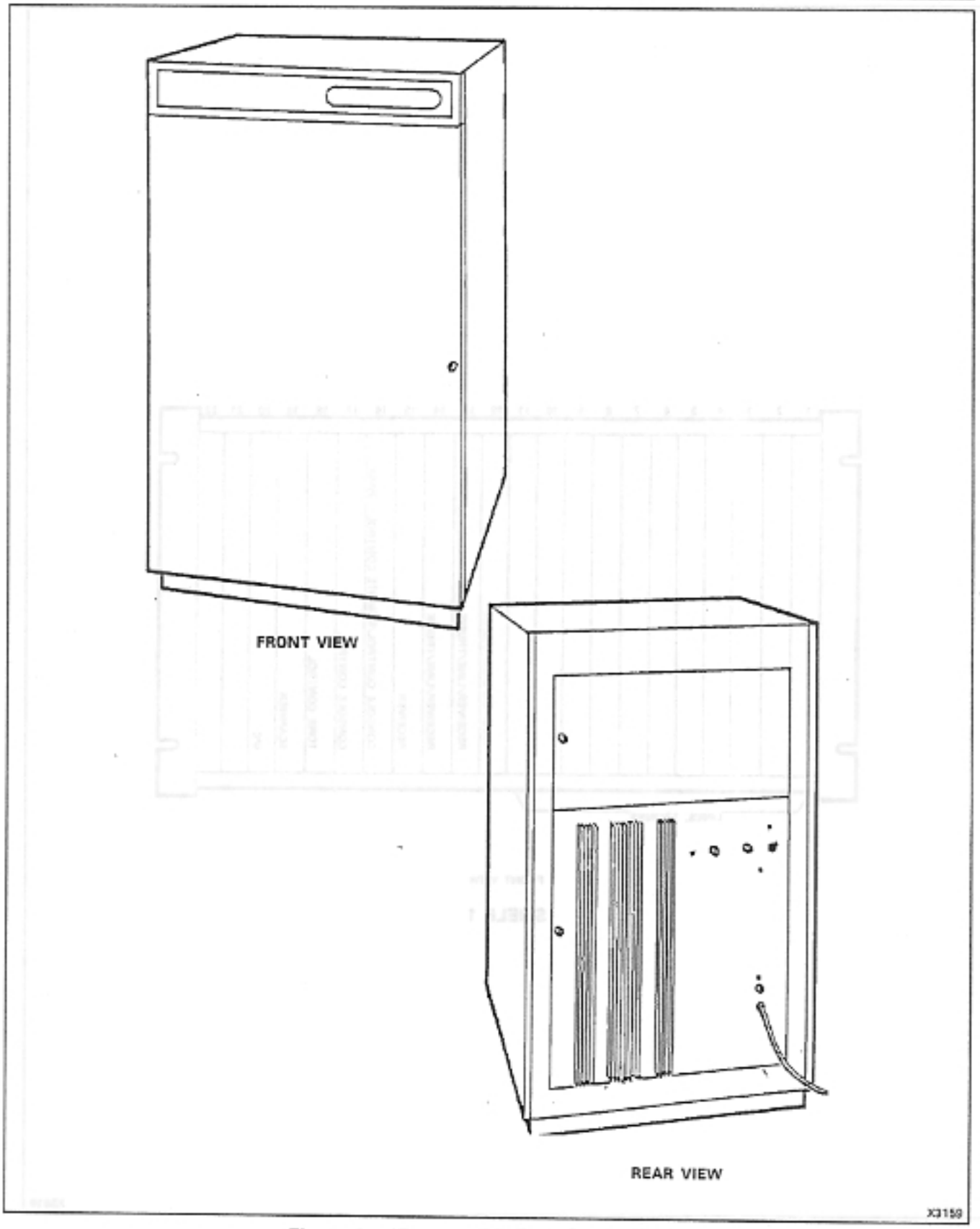
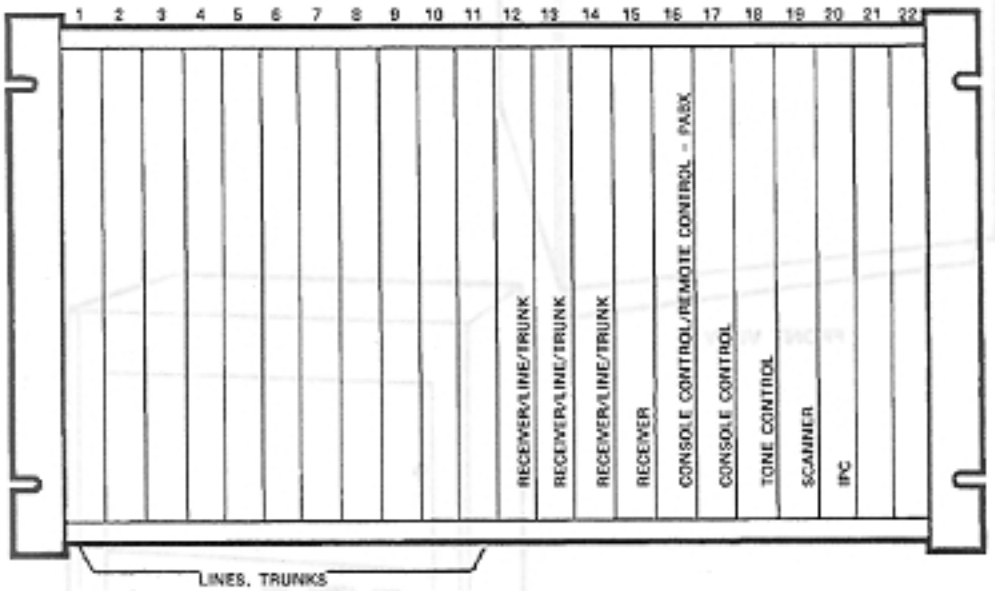


Figure 3-3 SX-200 Equipment Cabinet



FRONT VIEW

SHELF 1

X5619

Figure 3-4 Equipment Shelf

Primary Power Supply

3.19 The system primary power supply (see Figure 3-5) mounted directly on the cabinet back panel (total weight 31.8 kg (70 lb)) provides all system power from either a 115 Vac, or a 230 Vac, 44 Hz - 64 Hz commercial supply.

Reserve Power Supply

3.20 The reserve power supply is designed to maintain completed system operation for a minimum of two hours in the event of a primary power failure. The batteries are housed in a completely enclosed shelf measuring 178 mm (7 in.) high, 483 mm (19 in.) wide, 381 mm (15 in.) deep and weighing approximately 43 kg (95 lb). The charging unit measures 178 mm (7 in.) high, 127 mm (5 in.) wide, 355 mm (14 in.) deep, weighs 6.4 kg (14 lb) and mounts inside the SX-200 cabinet (see Figure 4-1).

C. Common Components, SX-100/SX-200

Printed Circuit Cards

3.21 All circuit cards (see Figure 3-6) within the PABX are identical in construction and consist of a fiberglass board with printed wiring patterns on both of its faces. Riveted to the front of each board is a transparent faceplate which allows the LEDs mounted on the front of the boards to be easily seen. The color-coded card extractors located at the top and bottom of the faceplate identify the card position within a shelf and ensure that the card is seated correctly in the backplane connector.

Supervisor Console

3.22 The Supervisor Console is enclosed in a housing with a smoked plastic faceplate. Located on either side of the console are a pair of headset/handset jacks allowing simultaneous operation and supervision. The console keyboard holds three rows of ten nonlocking keys for the selection of features and completion of calls. On the right of the keyboard is a 12-key pushbutton dial pad. The console display, mounted above the keyboard, displays the active states of calls in progress. In addition to the Call Status Display is a Busy Lamp Field, a Trunk Group status field, a Call Waiting Indicator, a digital clock and three Alarm Indicators. The weight of the Supervisor Console is approximately 2.27 kg (5 lb) and its dimensions are: 350 mm (13.75 in.) wide, 173 mm (6.8 in.) high, 235 mm (9.25 in.) deep.

3.23 A complete description of the Supervisor Console is given in Section MITL9105/9110-090-315-NA, Supervisor Console Description and its operation in the Console Operating Instructions handbook.

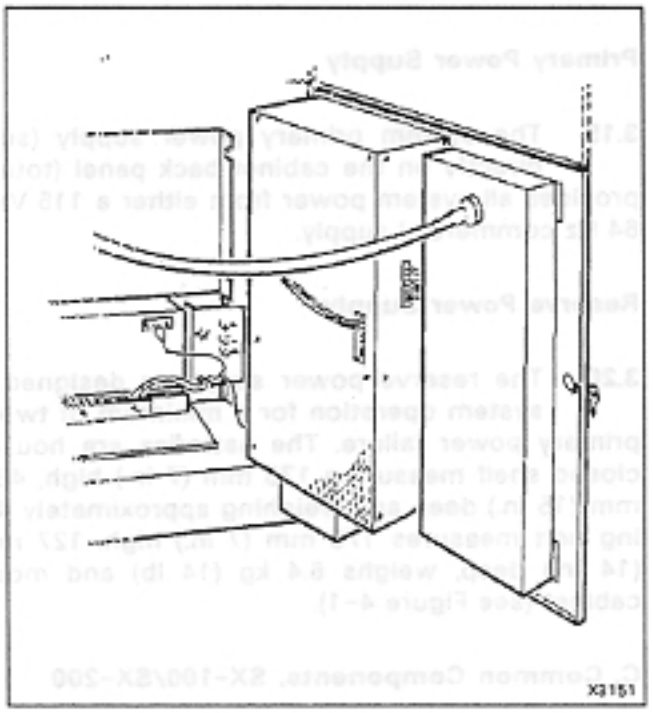


Figure 3-5 Primary Power Supply

Programming and Maintenance Console

3.24 The physical construction of the Programming and Maintenance Console is identical to that of the Supervisor Console. The only difference is in the functions of the call and feature selection buttons, which may be designated using the push-out tabs supplied.

3.25 The description of the Programming and Maintenance Console is given in Section MITL9105/9110-090-315-NA, Supervisor Console Description.

4. SYSTEM CONFIGURATION

General

4.01 Figure 3-1 shows the SX-100 cabinet which incorporates the equipment shelf, maintenance panel and primary power supply mounted from the front of the cabinet.

4.02 Figure 4-1 shows the SX-200 cabinet which incorporates two equipment shelves, the maintenance panel, the optional reserve power supply mounted in the base of the cabinet and the primary power supply mounted on the lower rear door.

4.03 These units are described in more detail in the following paragraphs.

Equipment Shelves

4.04 The equipment shelves contain the PCB cards in the necessary quantities required for a particular configuration, as illustrated in Figure 4-2. Shelf 1 must always be included as it contains all the necessary control circuitry. Shelf 2 is included on the SX-200 when the number of line, trunk and receiver cards exceeds 15.

4.05 Equipment Shelf 1 contains the four common control cards plus the required number of line, trunk and receiver cards. The common control cards are color-coded and held in card positions 18 through 20. The console control cards occupy positions 16 and 17; the first receiver card is held in position 15. These card positions are fixed for all systems. Card positions 1 through 14 may be equipped with line, trunk or receiver cards as shown in Figure 4-2. If there is a requirement for the ACD to be accessed from a MITEL RMAT System (see Section MITL9105/9110-98-101-NA, Remote Maintenance, Administration and Test System), the second Console Control card is replaced by a Remote Control - PABX card (see Figure 4-2).

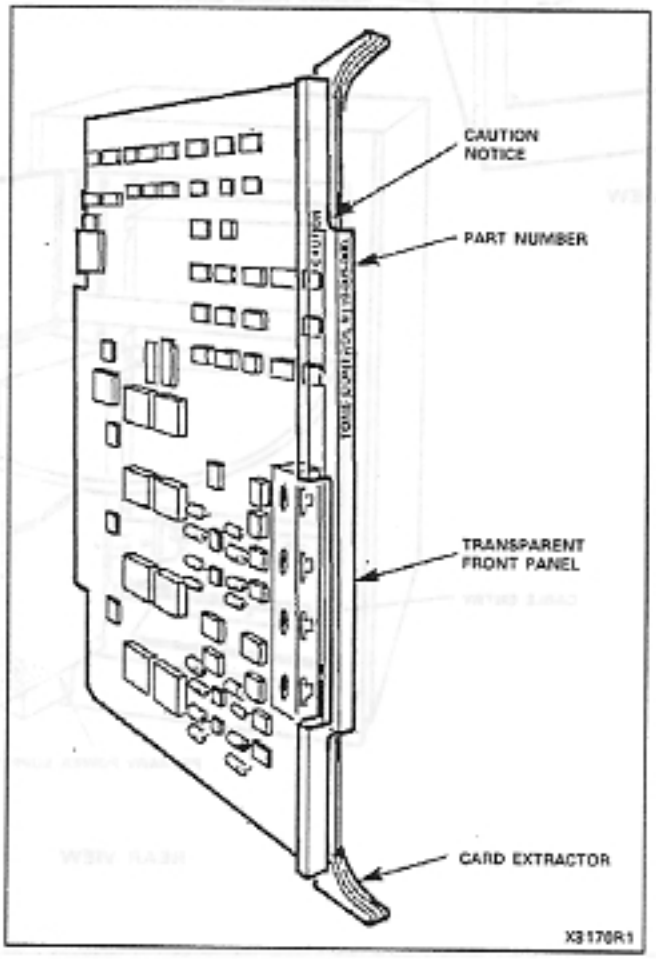


Figure 3-6 Typical Printed Circuit Card

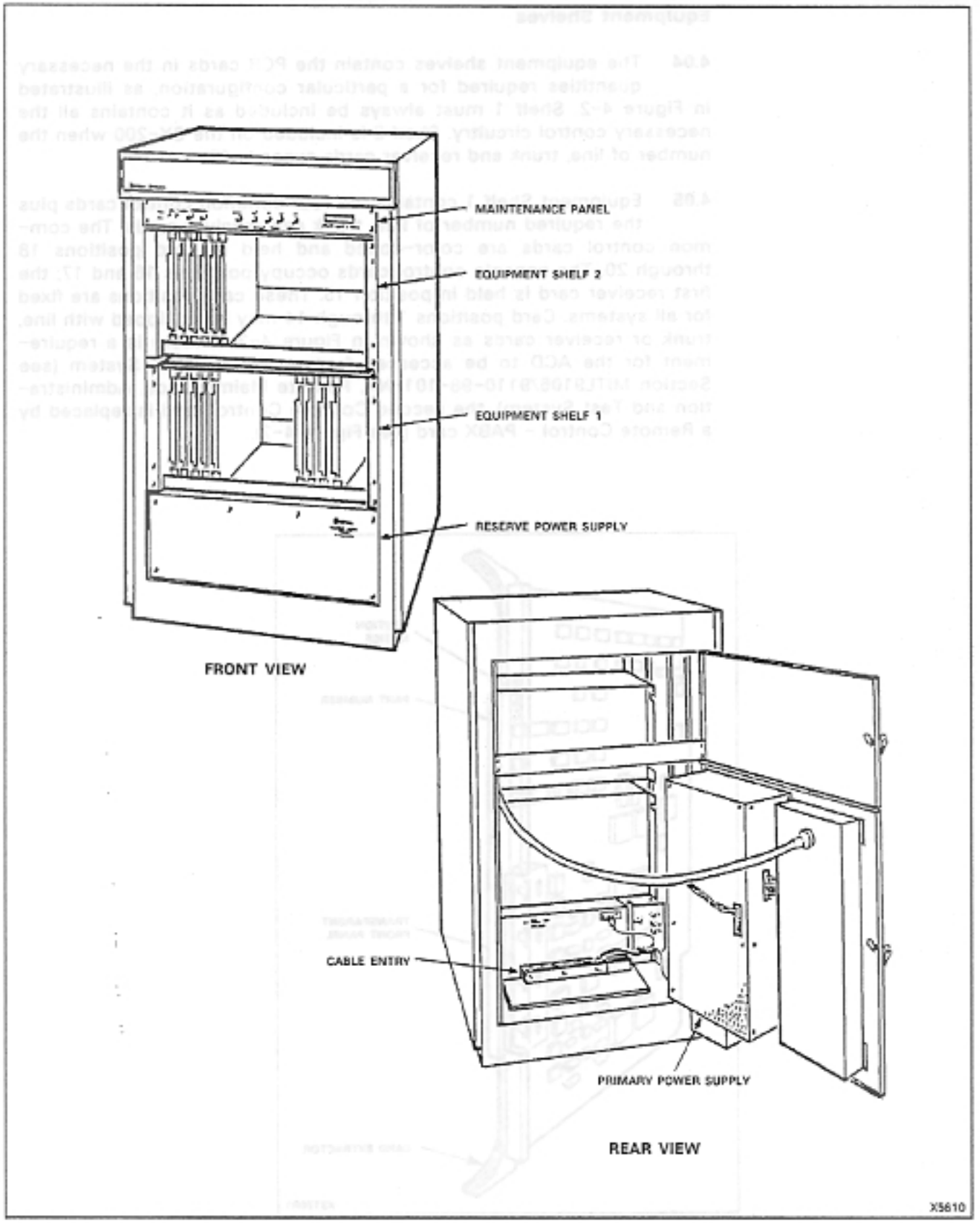
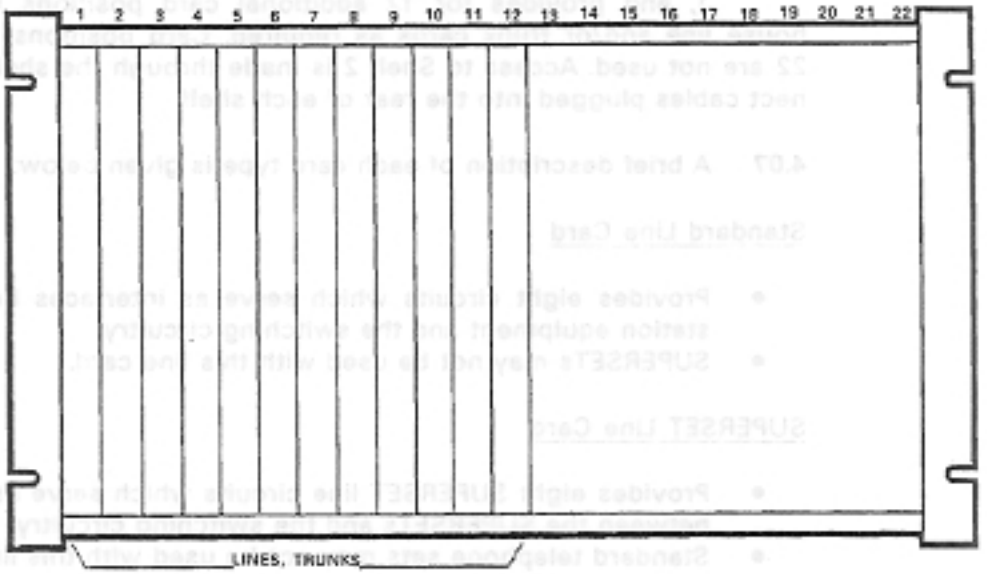
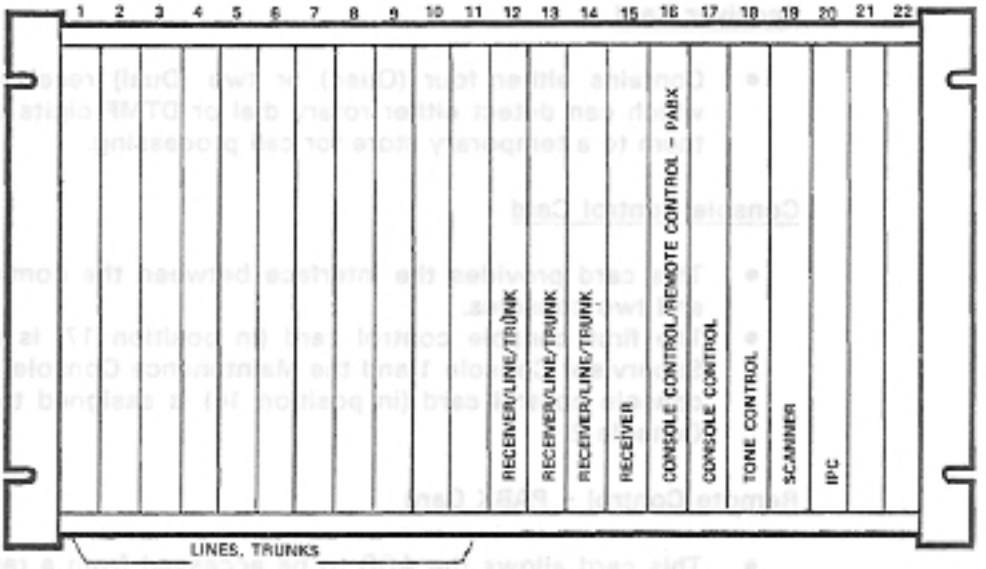


Figure 4-1 SX-200 Equipment Cabinet



FRONT VIEW

SHELF 2 (SX-200 ONLY)



FRONT VIEW

SHELF 1

X5209

Figure 4-2 Shelf Card Positions

4.06 Equipment Shelf 2 (SX-200) is identical in construction to Shelf 1, and provides for 12 additional card positions which may house line and/or trunk cards as required. Card positions 13 through 22 are not used. Access to Shelf 2 is made through the shelf interconnect cables plugged into the rear of each shelf.

4.07 A brief description of each card type is given below:

Standard Line Card

- Provides eight circuits which serve as interfaces between the station equipment and the switching circuitry.
- SUPERSETs may not be used with this line card.

SUPERSET Line Card

- Provides eight SUPERSET line circuits which serve as interfaces between the SUPERSETs and the switching circuitry.
- Standard telephone sets may not be used with this line card.
- When the SX-100/SX-200 is used with the SUPERSET 4™, a maximum of 64 SUPERSETs may be used.

Trunk Card

- Provides interfacing either between the Central Office and the ACD switching circuitry for four CO trunks, or between other ACDs and the SX-100/SX-200 for two Tie trunks.

Receiver Card

- Contains either four (Quad) or two (Dual) receivers, each of which can detect either rotary dial or DTMF digits and transfer them to a temporary store for call processing.

Console Control Card

- This card provides the interface between the common control and two consoles.
- The first console control card (in position 17) is assigned to Supervisor Console 1 and the Maintenance Console. The second console control card (in position 16) is assigned to Supervisor Console 2.

Remote Control - PABX Card

- This card allows the ACD to be accessed from a remote maintenance centre for the purpose of conducting administrative, maintenance and test routines on the ACD.
- The card is not normally supplied with the ACD system and forms part of the RMAT System (consult Section MITL9105/9110-98-101-NA, Remote Maintenance, Administration and Test System).

Tone Control Card

- All call process tones are supplied by this card.
- In addition, this card contains the DTMF and DP generators, voice paging circuitry, music-on-hold circuitry and diagnostic testing functions.

Scanner Card

- Sequentially scans all ports to detect signals that require processor action.
- The scanner card controls the RS232 port baud rate (300 or 1200 baud). This card also contains the night bell and paging control relays.

IPC Card

- This card contains the system operating software in the form of a PROM card module on the CPU card.
- The CPU card also contains the microprocessor and associated circuitry.
- This card also provides RAM (Random Access Memory) for customer data and scratch pad applications.
- The customer data memory is protected from power failure by a card-mounted battery pack.

4.08 Figure 4-3 illustrates the basic interconnections of the foregoing cards to provide the desired facilities.

Primary Power Supplies

4.09 The SX-100 and SX-200 primary power supplies generate the system operating voltages of +8 V, -5 V, -10 V, -48 V and 90 Vac ringing voltage from a 115 Vac power mains input (optionally 230 Vac). These units are fully described in Parts 8 and 9.

4.10 Separately mounted on the top of the SX-100 equipment shelf are power fail transfer relays. In the SX-200 cabinet these are separately mounted on the left side of the equipment cabinet (as viewed from the rear). These relays allow for the connection of up to six Central Office trunks to selected SX-100 ACD stations or 12 Central Office trunks to selected SX-200 ACD stations, in the event of a major system failure.

Supervisor Console

4.11 The three rows of buttons on the console faceplate are used to select and handle calls. Each button has a light-emitting diode (LED) associated with it to indicate the status of the call appearing on that button.

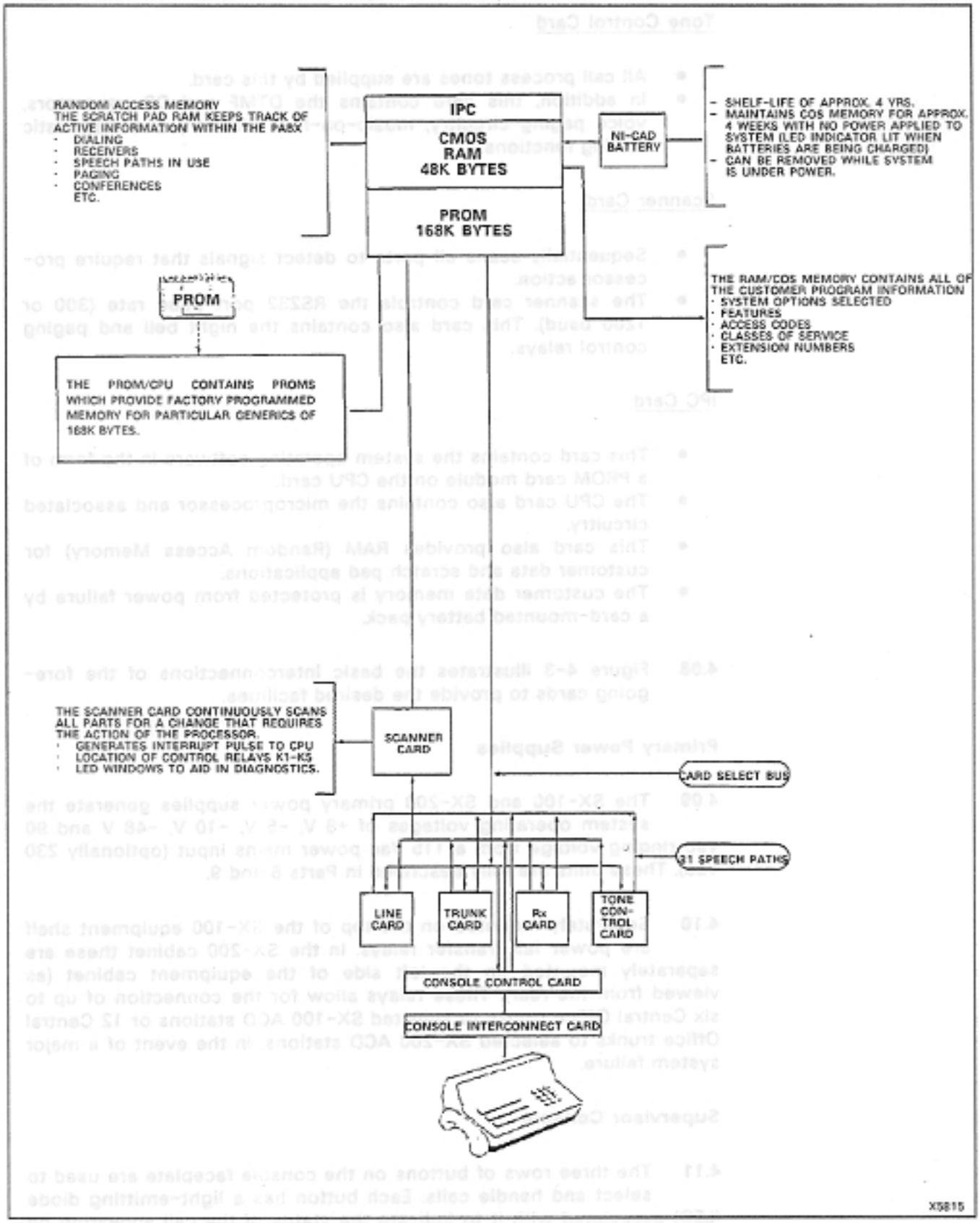


Figure 4-3 Data Flow Interconnections

4.12 The console display area provides the supervisor with specific information concerning the call which is being handled, as well as general information such as the time of day, and the busy/idle status of ACD stations, trunks and trunk groups.

5. FEATURES

General

5.01 The ACDs offer a number of features which are provided by a software package, known as Generic ACD. A full description of these features appears in Section MITL9105/9110-090-105 -NA, Features and Services Description. Certain limitations apply in the use of the System Features and these are listed in Table 5-1.

Class of Service

5.02 The station features can, for convenience, be grouped into sets of different Classes of Service (up to a maximum of 16). Each Class of Service incorporates a different combination of features and restrictions allocated to that Class of Service.

5.03 Section MITL9105/9110-090-210-NA, System Programming fully describes the system programming which allows the features to be properly coordinated with the system requirements for the trunks, extension lines and Supervisor Console. The customer's particular requirements are met by entering the appropriate data from the Supervisor (or Maintenance) Console; the Class-of-Service Option being one example of such data.

6. SYSTEM ENVIRONMENTAL AND INSTALLATION REQUIREMENTS

General

6.01 This Part is concerned with the design parameters of the ACD system insofar as they are affected by environmental conditions. Electrical characteristics and performance are detailed in the subsequent parts of this Section.

6.02 The parameters in this Part are segregated into the following subparts: Design Data and Compatibility as detailed in 6.03 and 6.04, Shipping and Storage data as detailed in 6.05 and Installation Requirements as detailed in 6.06 to 6.09.

Design Data

6.03 The ACD systems are designed to operate within the following environmental conditions:

(a) Temperature. The systems operate satisfactorily in the range of 0°C to 40°C (32°F to 104°F) maximum. These are ambient temperatures as measured at a point 150.1 cm (59.1 in.) above the floor and 3.81 cm (1.5 in.) in front of the equipment.

TABLE 5-1
SYSTEM FEATURE LIMITATIONS R1

Maximum number of simultaneous calls = 31.

Maximum number of speech paths used by any call = 2.

Maximum number of simultaneous consultations = 15.

Maximum number of simultaneous add-on (3-way) calls = 30.

Maximum number of simultaneous station-controlled conference calls = 30.

Maximum number of calls that can simultaneously be camped-on to an extension, Trunk Group or Hunt Group = 30.

Maximum number of simultaneous callbacks that can be enabled = 32.

Maximum number of simultaneous call forwards that can be enabled = 208 (SX-200); 112 (SX-100).

Maximum number of simultaneous "Dial 0" calls = 31.

Maximum number of hunting groups = 12.

Maximum number of calls that can be simultaneously connected to Music on Hold = 31.

Maximum number of stations in a Station Hunting Group = 208 (SX-200); 112 (SX-100).

Maximum number of stations in a Call Pickup Group = 208 (SX-200); 112 (SX-100).

Maximum number of dial call Pickup Groups = 30.

Maximum number of trunks assignable to night stations = 100 (SX-200); 52 (SX-100).

Maximum number of trunks in a Trunk Group = 104 (SX-200); 56 (SX-100).

Maximum number of Trunk Groups = 12.

Maximum number of calls that can override a given extension = 1.

Maximum number of calls that can be simultaneously parked = 31.

Maximum number of simultaneous meet-me conferences = 1.

Maximum number of simultaneous supervisor-controlled conferences = 1

Maximum number of calls that can be simultaneously held by one supervisor = 4.

Maximum number of simultaneous incoming calls that can be separately identified by the supervisor = 6 (Recall, Dial 0, LDN 1 through LDN 4).

Maximum number of LDNs that can be identified at the Supervisor Console = 4.

Maximum number of simultaneously ringing wake-ups = 10.

Maximum number of speed call tables = 25.

Maximum number of personal speed call tables = 18.

Numbering schemes may be 1-, 2-, 3- or 4-digit or a combination of 1, 2, 3 and 4 digits, as long as there are no conflicts in the first digits.

Maximum number of trunk buffers for SMDR = 31.

Maximum number of speed call digits that may be stored = 56 (per table).

Maximum number of SUPERSET 4s = 64.

TABLE 6-1
STORAGE CONDITIONS

R1

Temperature Range	-50°C to 71°C (-58°F to 159.8°F)
Relative Humidity	Up to 100% RH at 18°C (64.4°F) i.e.: 15 mm Hg water vapour pressure
Vibration	.5 g_n (4.903 m/s²) (Sinusoidal) 10 to 500 Hz
Shock	Up to 75 cm (30 in.) drop depending on package
Low Pressure	87 mm Hg 15,152 m (50,000 ft)
Temperature Shock	-50°C to 25°C (-58°F to 75°F) in 5 minutes

(b) Relative Humidity Range. The system operates when subjected to a relative humidity range of 10% to 90%, noncondensing.

(c) Acoustic Noise. The systems do not radiate acoustic noise greater than 45 dB SPL, "A" weighted, measured 1200 mm (47.2 in.) from the center of the cabinet.

(d) Vibration. The systems operate satisfactorily when subjected to a continuous vibration of 5-200 Hz with an acceleration of 0.5 g.

(e) Electrostatic Discharge. The systems meet the following electrostatic discharge test:

With the common equipment grounded, a voltage of 15 kV placed to various parts of the equipment, such as faceplates, switches, etc., has no noticeable effect on the operation of the system. With all the exposed metal of the peripheral equipment grounded, a voltage of 15 kV applied to various parts of the peripheral equipment, has no noticeable effect on the operation of the system. The high voltage DC is derived from an induction-type generator with an output capacity of 250 pF and a series resistance of 3.9 kohms.

(f) Electromagnetic Susceptibility. The systems are able to work in an electric field of 50 V/m without major degradation of service.

Compatibility

6.04 The systems are compatible with:

- Single line 2500- or 500-type telephone sets or equivalent station apparatus.
- Line cards of a 1A1/2 telephone key system.
- Standard Dial Pulse and DTMF telephone sets equipped with or without message waiting lamps.
- Step-by-step, crossbar and commonly used electronic central office equipment.

Shipping and Storage

6.05 The equipment is designed to withstand shipping by truck, rail, air or sea without damage, when packaged in conventional shipping containers of the manufacturer. The range of environmental conditions that the equipment is capable of withstanding in storage is shown in Table 6-1.

Installation Requirements

6.06 The installation requirements are detailed in Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation.

Cabling and Cross-Connections

6.07 The following paragraphs detail the cabling and cross-connections required when installing the electronic ACD.

Telephone Set and Trunk Cabling

6.08 Telephone set and trunk cabling terminates on the building cross-connect terminal in the normal manner. The cabling requirements and limits for stations and consoles are shown in Figures 6-1 and 6-2.

Cable Terminals

6.09 Section MITL9105/9110-090-200-NA, Shipping, Receiving and Installation, gives full details of the requirements for interconnection of cables between the building cross-connect terminal and the connector locations in the rear of the cabinet (Figures 6-3 and 6-4). This includes the power fail transfer connections between the cabinet and the cross-connect terminal.

7. PROGRAMMING AND NUMBERING

A. General

7.01 The firmware of the SX-100/SX-200 is written in a manner that allows maximum flexibility during installation or whenever a change is required. The features discussed in Part 5 of this Practice are built into the system and may be enabled or disabled with a simple change of parameters by the installer or repairman. This procedure is called programming and may be accomplished from either a Maintenance Console or an Supervisor Console. Full details of the programming procedures are contained in Section MITL9105/9110-090-210-NA, System Programming.

B. Programs

7.02 Seven service programs, in the following order, are initially placed in the system to control the entry of subsequent data:

- System Options
- Class-of-Service Options
- Access Code Assignments
- Extensions
- Extension Hunt Groups
- Trunks
- Trunk Groups.

7.03 Other additional service programs, dependent upon the type of software installed in the ACD, may be implemented. These are listed below and include relevant MITEL Practice references, which should be consulted for descriptions and programming requirements.

(a) Traffic Measurement: see Section MITL9105/9110-090-450-NA.

(b) Multi-Digit Toll Control: see Section MITL9105/9110-090-212-NA.

(c) Station Message Detail Recording: see Section MITL9105/9110-090-451-NA.

(d) Speed Call: see Section MITL9105/9110-090-220-NA.

(e) Automatic Route Selection: see Section MITL9105/9110-090-213-NA.

7.04 The scope of the programming capability caters to all changes which may be expected during the normal operation of the ACD; i.e., no modification or wiring and component changes are necessary. The foregoing programs are discussed in more detail in the following paragraphs.

System Options

7.05 System Options are those that affect the overall system including those relating to the console operation. A typical example is given below:

- **Discriminating Ringing.** A call originating external to the system results in a double ring signal, whereas an internal call results in a single ring signal. If this option is enabled it affects ALL extensions within the system.

Classes of Service

7.06 Classes of Service are sets of features and/or restrictions which can be applied to a single extension or to a group of extensions. These classes are then subsequently assigned to exten-

sions in the Extension program or to trunks in the Trunk program. Examples of Class-of-Service Options are:

- **Paging Access.** An extension which has Paging Access in its Class of Service can dial the appropriate code(s) and be connected to a user-supplied paging system(s).

- **Executive Busy Override.** An extension with Executive Busy Override in its Class of Service can "barge-in" to a conversation by dialing a code over the busy tone.

- **Station Override Security.** It is also possible to set the Station Override Security option which will disallow another extension's override capability.

As suggested by these examples, a great deal of flexibility exists within the system, and groups of features can be easily set in place for the various extensions.

7.07 Paragraph 7.19 details a particular case where an extension is fully restricted, and is an example of a Class of Service incorporating restrictions rather than access to features.

Access Code Assignments

7.08 Access codes are allotted for desired features and programmed into the System. These codes may consist of one, two, three or four digits and must be unique; i.e., they must not conflict with any other numbers allotted within the system. (Note the exceptions for override, callback busy.) Extensions may have the capability of dialing these codes subject to whether their Class of Service incorporates these particular features. Typical access code examples include such features as Paging and Executive Busy Override.

Extensions

7.09 An extension is connected from the building cross-connect field and, via the cable between it and the shelf backplane, to a port within the equipment shelf. The port is identified with a particular equipment number and, by means of the Extension program, is given an extension number and linked to the required Class of Service. It is then allowed or denied toll access, assigned an appropriate Busy Lamp on the Supervisor Console and linked to a Pickup Group. Changes, such as the allotment of a new extension number or additional features (including restrictions), are effected by simple keying sequences from the Supervisor (or Maintenance) Console. The console must be in the programming mode.

Extension Hunt Groups

7.10 Hunt Groups are programmed with their own master access codes and with the equipment number (port) of each extension that is to be part of the particular group. This master number must be unique within the system. It cannot be one of the extension numbers

of the group. This method is required to ensure that the Call Forwarding and Call Back features are available even when an extension is part of a Hunt Group. Use of a master number also eliminates any conflict between hunting and forwarding.

7.11 Hunt Groups can be arranged to be of the terminal, circular or secretarial type, as detailed hereunder: Terminal hunting results in the group being accessed successively from the first to last extensions programmed into the group, with the first nonbusy extension in the sequence being rung. Circular hunting starts at the last extension which was reached and hunts over all extensions until the first free extension is reached. Secretarial hunting is similar to Terminal hunting, with the additional facility that the last number in the group is common to two or more groups. It should be noted that each extension is otherwise a normal extension and can receive calls directed to it as for other extensions.

Trunks

7.12 Trunk lines are programmed in a similar manner (for similar reasons) to extension lines (see 7.09). They are allotted an equipment (port) number; a trunk code (which defines the type of trunk - CO, DISA, etc); a Busy Lamp; and an LDN (listed directory number position on the console). In addition they may be assigned a "Day" and "Night" option which enables the trunk to ring a particular night bell and/or directly access a particular extension or Hunt Group. A Class-of-Service code can be provided for dial-in trunks to enable them to have access to features such as paging.

Trunk Groups

7.13 In addition to the individual trunk program (paragraph 7.12) one or more trunk lines may be programmed into groups having particular requirements. They must be given an access code and may be toll-denied. Note that toll denial requires that both the extension and the trunk group must be programmed with toll denial to prevent toll calls. This allows a given extension to be denied toll access on one group of trunks but not on another. Finally, the trunk groups must each be given a 4-digit type code, which defines such things as answer supervision, toll reversal, message registration and DTMF or DP signaling. One group can also be programmed to overflow into another similar group when the former group is busy.

Toll Control

7.14 The Multi-Digit Toll Control program allows a customer to specify the toll calls which may be made from any extension within the ACD. The level of toll control for any extension can range from full capability (i.e., ability to dial any toll call) to being restricted to calling a single directory number. An extension can also be inhibited from making any toll call. A full description of this program is given in Section MITL9105/9110-090-212-NA, Multi-Digit Toll Control.

Traffic Measurement

7.15 The Traffic Measurement program allows a user to output traffic data to a customer-provided terminal (printer or magnetic tape recorder), which is connected to the RS232 data port of the ACD. Alternately the data may be transmitted to a remotely located terminal (using a modem) over the public telephone network. Full details are contained in Section MITL9105/9110-090-450-NA, Traffic Measurement.

Station Message Detail Recording

7.16 The Station Message Detail Recording program allows a business to analyze its telephone costs by collecting data for each outgoing and/or incoming trunk call. The data contain details such as: called and calling party numbers; data, time, duration of each trunk call; and whether ACD parties were transferred or put into conference during a trunk call. The data is output from the RS232 port and may be recorded for subsequent processing by a service bureau. Alternately, records may be printed and the records analyzed by hand. Section MITL9105/9110-090-451-NA, gives details of the SMDR feature.

Speed Call

7.17 The Speed Call program allows selected stations to use their own personally programmed speed call tables. Also, programmed stations and the supervisor can use other speed call tables which are available to them on a common-use basis. This feature is described in Section MITL9105/9110-090-220 -NA, Speed Call.

7.18 The Automatic Route Selection (ARS) program allows a business to reduce its telephone toll trunk costs. This is done by specifying up to three time periods a day. An extension may or may not be subject to the ARS program. If it is subject, the extension will be steered through the trunks selecting the most desirable (cheapest) for that time period. For further information see Section MITL9105/9110-090-213-NA, Automatic Route Selection (ARS).

C. Extension Restrictions

7.19 The following list exemplifies the case where restriction of extension capabilities is accomplished by programming a combination of restrictive Class-of-Service options into the extension's Class of Service. These, and other options allow extreme flexibility in the degree of restriction assigned to a given Class of Service. This Class of Service allows a station to call the supervisor by lifting the handset, and allows the station to be called by the supervisor or any unrestricted extension. Functions such as consultation and access to trunks are not available.

Option Number	Option Name
38	Never a Forwardee
43	Inward Restriction (DID)
46	Flash Disable
47	Never a Consultee
57	Manual Line
59	Non-CO Trunks via Supervisor Inhibit
60	CO Trunks via Supervisor Inhibit

7.20 The extension capabilities may be made less restrictive by deleting some of the foregoing options or adding other options, and may be made even more restrictive by including, for example, Option 44 (Originate Only) or Option 45 (Receive Only).

D. Numbering Plan

7.21 The ACD allows a completely flexible, user-defined numbering plan. Extension numbers can be up to four digits in length and all combinations are acceptable provided that they do not conflict with each other or with feature access codes (e.g., if one number is 2000, neither 200 nor 20 can be used).

7.22 Since they are programmable, extension numbers need not be considered when the cabling and installation are performed. Instead, each equipment port is assigned the requested access number from any console that has been placed in programming mode. Similarly, an extension number can be changed at a later date by a simple keying sequence from the console.

8. TECHNICAL DESCRIPTION

A. General

8.01 The SX-100/SX-200 are microprocessor-controlled ACDs which use distributed processing and space-division switching. The main processor which has overall control of the system is an MC6809. It is supported by 48 kbytes of Random Access Memory (volatile) used as a scratch pad for current activity (such as which extensions are off-hook), and installation-dependent information (such as access codes and extension numbers). The system also provides up to 168 kbytes of Programmable Read Only Memory (PROM) containing the firmware which is programmed into it at the factory.

8.02 The console contains an MC6802 microprocessor with four kbytes of EPROM which controls the displays, and monitors such things as keystrokes. On each trunk circuit card is an MC6802 processor with up to 4 k of PROM that controls functions such as seizing and releasing trunks.

8.03 The ACD uses a specially developed large scale integrated (LSI) circuit to implement a space-division switching matrix. The basis of this space division is a 4-by-8 bit analog crosspoint switch (MITEL MT8804) which is used throughout the system to connect any one of 31 speech paths to any one (or more) extension, trunk, console, receiver or tone generator circuit(s). Such connections are controlled by the microprocessor via its data and address lines. These, together with the card select, interrupt power and other lines, run the length of the equipment shelf backplane and are available as required to each circuit card. See Table 8-1 and Figure 8-2 for a description of the backplane signals.

B. Speech Path Accessing

8.04 Each speech path (including the "Music on Hold" speech path) is directly wired on each line, trunk, tone, receiver and console control circuit card to an 8804 which can, under processor control, be connected to any circuit on the card (i.e., a line circuit, a tone generator, etc). The processor sends a card select (CS) signal to access a particular card together with a combination of address lines and data lines which close the required "contact". The concept discussed in the foregoing description is illustrated in Figure 8-1.

C. Operational Details

8.05 The following subparagraphs detail the sequence of circuit operations encountered within the ACD system during the progress of calls.

8.06 Figure 8-2 and Table 8-1 should be consulted when reading the descriptive material. In addition, the following abbreviations have the meanings indicated in the text:

CO	- Central Office (main public exchange)
DISA	- Direct Inward System Access enables incoming trunk calls (DTMF - type only) to dial ACD features or extensions directly
DP	- Dial Pulse signaling
DTMF	- Dual Tone Multi-Frequency signaling
GS/LS	- Refers to trunk circuits with a "ground-start" (GS) or "loop-start" (LS) facility
OP-AMP	- operational amplifier
LED	- light-emitting diode
PCB	- printed circuit board
UART	- Universal Asynchronous Receiver Transmitter.

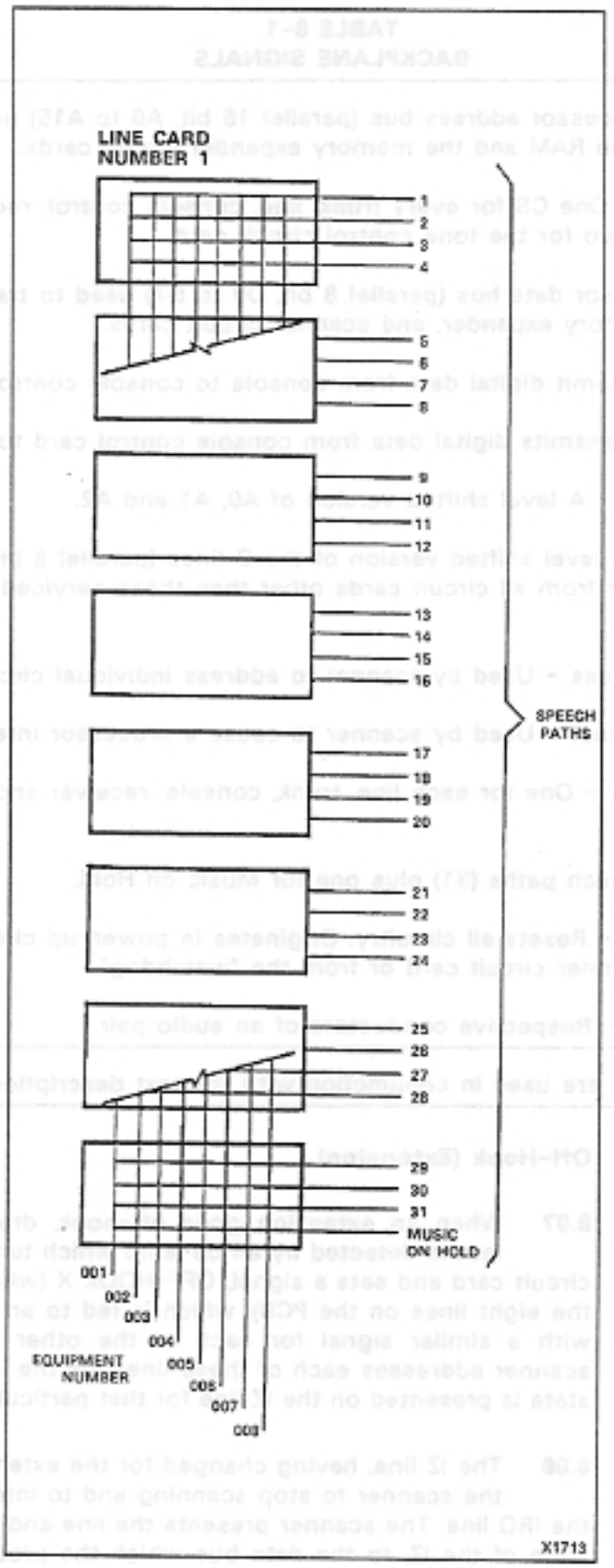


Figure 8-1 Speech Path Access Circuit

TABLE 8-1
BACKPLANE SIGNALS

R1

A	Address – Processor address bus (parallel 16 bit, A0 to A15) used to address memory on the RAM and the memory expander circuit cards.
CS	Card Select – One CS for every trunk, line, console control, receiver, and scanner circuit card; two for the tone control circuit card.
D	Data – Processor data bus (parallel 8 bit, D0 to D7) used to transmit data to/from the RAM, memory expander, and scanner circuit cards.
DI	Data In – Transmit digital data from console to console control card.
DO	Data Out – Transmits digital data from console control card to console.
HA	High Address – A level shifted version of A0, A1 and A2.
HD	High Data – A level shifted version of the D lines (parallel 8 bit, HD0 to HD7). Sends data to and/or from all circuit cards other than those serviced directly by the D lines.
IA	Interrupt Address – Used by scanner to address individual circuits on each card.
IRQ	Interrupt Request – Used by scanner to cause a processor interrupt.
IZ	Interrupt Zone – One for each line, trunk, console, receiver and tone control circuit card.
J	Junctor – Speech paths (31) plus one for Music on Hold.
MRST	Master Reset – Resets all circuitry. Originates in power-up circuitry from the reset switch on scanner circuit card or from the "watchdog".
TR	Tip and Ring – Respective conductors of an audio pair.

Note: The above symbols are used in conjunction with the text description and Figure 8-2.

Off-Hook (Extension)

8.07 When an extension goes off-hook, drawing loop current, the fact is detected by an op-amp which turns on a LED on the line circuit card and sets a signal, OFF-HOOK X (where X represents one of the eight lines on the PCB), which is fed to an analog switch together with a similar signal for each of the other seven lines. When the scanner addresses each of these lines via the IA bus, the OFF-HOOK X state is presented on the IZ line for that particular line circuit card.

8.08 The IZ line, having changed for the extension addressed, causes the scanner to stop scanning and to interrupt the processor via the IRQ line. The scanner presents the line and card addresses, and the state of the IZ, to the data bus which the processor then reads while restarting the scanner.

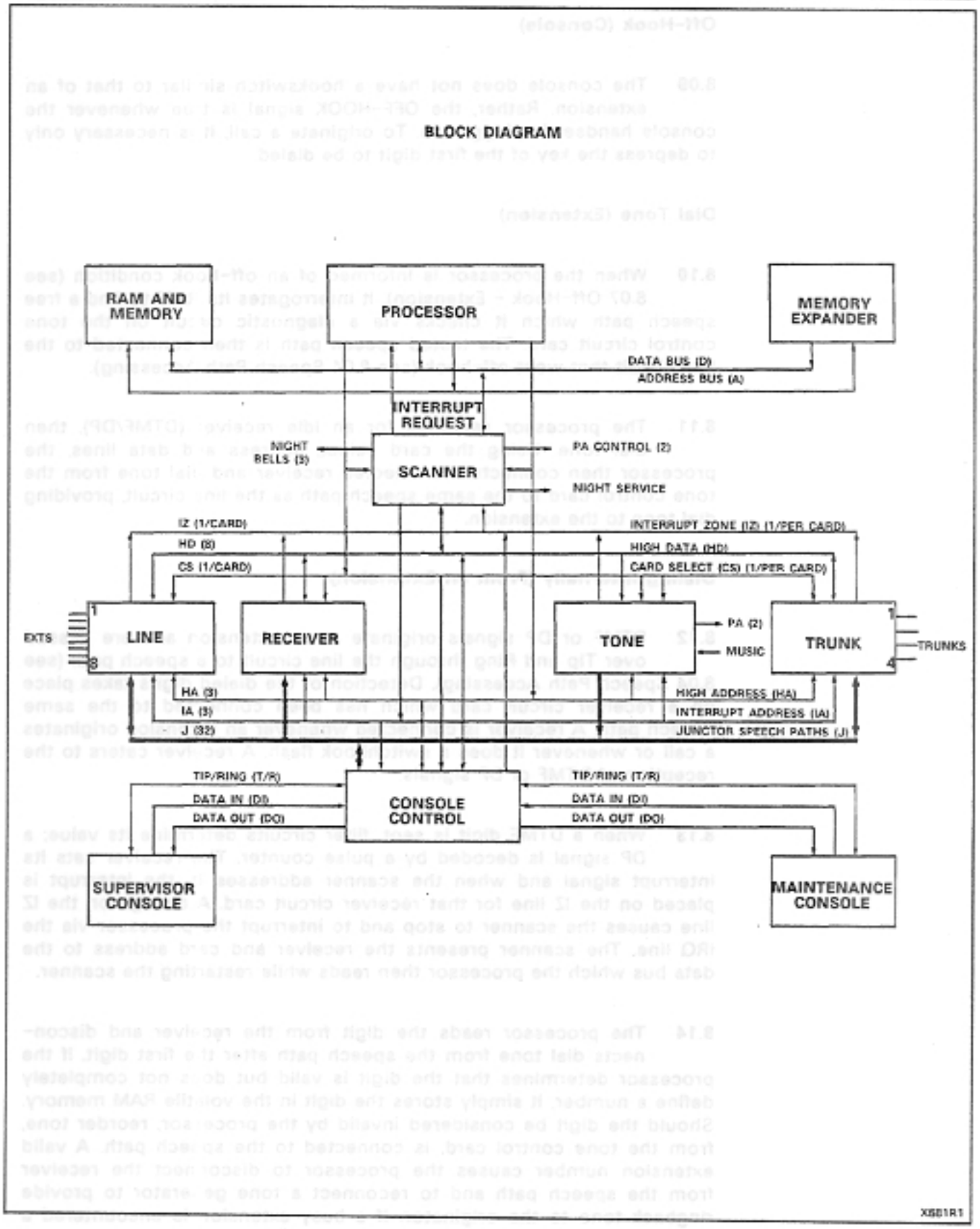


Figure 8-2 Call Processing Block Diagram

Off-Hook (Console)

8.09 The console does not have a hookswitch similar to that of an extension. Rather, the OFF-HOOK signal is true whenever the console handset is plugged in. To originate a call, it is necessary only to depress the key of the first digit to be dialed.

Dial Tone (Extension)

8.10 When the processor is informed of an off-hook condition (see 8.07 Off-Hook - Extension), it interrogates its RAM to find a free speech path which it checks via a diagnostic circuit on the tone control circuit card. The tested speech path is then connected to the line circuit that went off-hook (see 8.04 Speech Path Accessing).

8.11 The processor searches for an idle receiver (DTMF/DP), then dial tone. Using the card select, address and data lines, the processor then connects the selected receiver and dial tone from the tone control card to the same speech path as the line circuit, providing dial tone to the extension.

Dialing Internally (From an Extension)

8.12 DTMF or DP signals originate at an extension and are passed over Tip and Ring through the line circuit to a speech path (see 8.04 Speech Path Accessing). Detection of the dialed digits takes place on a receiver circuit card which has been connected to the same speech path. A receiver is connected whenever an extension originates a call or whenever it does a switchhook flash. A receiver caters to the reception of DTMF or DP signals.

8.13 When a DTMF digit is sent, filter circuits determine its value; a DP signal is decoded by a pulse counter. The receiver sets its interrupt signal and when the scanner addresses it, the interrupt is placed on the IZ line for that receiver circuit card. A change on the IZ line causes the scanner to stop and to interrupt the processor via the IRQ line. The scanner presents the receiver and card address to the data bus which the processor then reads while restarting the scanner.

8.14 The processor reads the digit from the receiver and disconnects dial tone from the speech path after the first digit. If the processor determines that the digit is valid but does not completely define a number, it simply stores the digit in the volatile RAM memory. Should the digit be considered invalid by the processor, reorder tone, from the tone control card, is connected to the speech path. A valid extension number causes the processor to disconnect the receiver from the speech path and to reconnect a tone generator to provide ringback tone to the originator. If a busy extension is encountered a special busy tone is connected to the speech path.

Dialing Internally (From a Console)

8.15 Unlike an extension, the console key pad generates neither DTMF nor DP. Instead the microprocessor inside the console notes which key was depressed and looks in the console ROM to find the corresponding 8-bit code. This code is converted by a UART to a serial string of data, complete with start and stop bits and is sent as a differential signal along one of the 25 pairs of wires leading to the interconnect card and from there to the console control card.

8.16 In the equipment shelf, this signal enters the console control card as DI. It is converted by another UART into parallel data and sets a DATA READY bit which goes out onto the IZ line when the scanner addresses this console control circuit.

8.17 After the processor has received a console interrupt from the scanner, has read the dialed code from the data bus and has determined which digit has been sent, it stores the digit in the RAM (see Off-Hook (Console)). If the digit is considered invalid, the processor connects reorder tone from the tone control card to the console's speech path. When the firmware's logic decides that the number is complete, it rings the extension dialed (see Ringing an Extension). It also connects a tone generator to the console's speech path to provide ringback tone. Note that a receiver is not used for dialing from a console.

Ringing an Extension

8.18 The dialing of a valid extension number prompts the processor to select a particular line on a particular circuit card (as determined by the programming in the non-volatile RAM) and to send a data line command there to turn on ringing current to the extension. When the extension is answered, the line circuit detects an off-hook condition (see Off-Hook Extension) and disconnects ringing. The processor then connects the called extension to the speech path of the calling device (extension, console or trunk).

Hook-flash

8.19 A hook-flash is defined for the ACD as an on-hook condition of between 200 ms and 1500 ms (700, 900 or 1100 ms may be used as a system option) following an off-hook condition, where a speech path has been established between an extension and a trunk or between two extensions. When an extension goes on-hook, the scanner notifies the processor which first checks its memory to determine whether a flash is legal at that point. If not, the extension is disconnected from the speech path and a subsequent off-hook is interpreted as the beginning of a new call (see Off-Hook). However, when a flash is determined to be a legal operation, the firmware is designed to start a timer. If the extension goes back off-hook within the specified time period, it is considered to be flashing. An on-hook of less than 200 ms is considered to be a noise glitch while an on-hook greater than 1500 ms (700, 900 or 1100 ms alternatively) is considered as a call termination (hang-up).

8.20 When a flash is detected, the processor disconnects the flashing extension from its speech path, finds a free speech path which it tests and connects the extension to it (see 8.04 Speech Path Accessing). It then provides transfer dial tone (see 8.10 Dial Tone (Extension)) and connects a receiver to the speech path allowing the extension to dial (see 8.12 Dialing Internally) and converse privately with a third party, or to access features.

8.21 Meanwhile, if the extension had flashed out of a conference, the conference is unaffected. However, if the other party was not in conference, it is disconnected from its speech path and connected instead to the HOLD junctor, which is a speech path with a low impedance such that it effectively "grounds" the output of any extension or trunk connected to it, thus preventing parties on the HOLD junctor from hearing each other.

Incoming Calls (GS/LS Trunks)

8.22 When the trunk circuit detects ringing voltage, or forward or reverse current, or a tip ground (ground start trunks), the trunk's microprocessor interrupts the system processor via the IZ/Scanner arrangement (see 8.09 Off-Hook-Console) and lights up the LED on the trunk card. The system then reads a status report from the trunk.

8.23 The system processor finds and tests a speech path (see 8.04 Speech Path Accessing) and notifies the programmed equipment (console or extension). When it answers, the system processor connects it and the trunk to the speech path and sends a data line command to the trunk card. The trunk card then terminates the trunk circuit and enables the audio.

8.24 If the trunk has been programmed for DISA, the system processor waits 10 seconds before answering and then connects a receiver and a dial tone generator. This allows the trunk to appear as though it were an extension and enables it to dial internal stations and features (see 8.10 Dial Tone (Extension) and 8.12 Dialing Internally (From an Extension)).

Dialing a CO Trunk (From an Extension)

8.25 When an extension has gone off-hook and is connected to dial tone and a receiver (see 8.10 Dial Tone (Extension) and 8.12 Dial Internally (From an Extension)), an access code is dialed to obtain a CO trunk. Upon determining the validity of this code, the processor interrogates the trunk circuit cards to find an available trunk in the appropriate trunk group. A data line seize command is then sent to the trunk's microprocessor and the trunk circuit is connected to the extension's speech path (see Speech Path Accessing). If the trunk is "ground start", the ring lead is grounded and the trunk's processor waits for CO acknowledgement. The trunk processor connects the audio network and enables the audio and the LED on the circuit card.

8.26 There are three basic configurations of Extension/Trunk Circuit conditions which are encountered as follows:

- DP extension accessing a DP trunk
- DTMF extension accessing a DTMF trunk
- DTMF extension accessing a DP trunk.

These three combinations result in a number of system connection configurations, depending upon whether the trunk is a CO or Tie and whether or not tone-to-pulse conversion is required:

(a) If Figure 8-3 (a) configuration is applicable, the dial pulses from the extension are repeated by a relay in the trunk card and enter the trunk circuit. The call proceeds under control of these pulses.

(b) If Figure 8-3 (b) conditions are applicable, then DTMF tones from the extension are routed over the speech path, through the trunk card to the main exchange and again the call proceeds normally.

(c) When DTMF extension dialing is used to a DP exchange, Figure 8-3 (c) conditions apply. In this case the DTMF tones are translated by the receiver to digital data and forwarded to the microprocessor, where it is translated into further data required by the trunk processor. The trunk processor converts this data to the proper dial pulse train required by the CO exchange. It should be noted that both the DTMF tones and DP signals will appear on the trunk circuit unless "inhibit outgoing audio until answer supervision" is returned from the CO.

8.27 The receiver is disconnected as soon as the trunk access code has been detected if both the extension and trunk are DTMF (Figure 8-3 (b)) and if Toll Denial is not checked. If the extension requires DTMF to DP conversion, the receiver is maintained until dialing is completed. Toll Denial requires that the receiver be maintained on the speech path until the required number of digits have been dialed (see Section MITL9105/9110-090-212-NA, Multi-Digit Toll Control).

Dialing a Tie Trunk (From an Extension)

8.28 The circuit operations described above are similar to those required for Tie Trunk circuits, with the following exceptions. For DP extensions to DP tie trunk circuits (Figure 8-3 (d)), the requirement exists to inhibit dial train distortion arising as a result of tandem operation through one or more tie trunks. For this reason, when the trunk processor receives the input data, it causes the output to the tie trunk to be a regenerated train of dial pulses. It should be noted also that the trunk processor isolates the speech path to prevent dial pulses from feeding back to the extension.

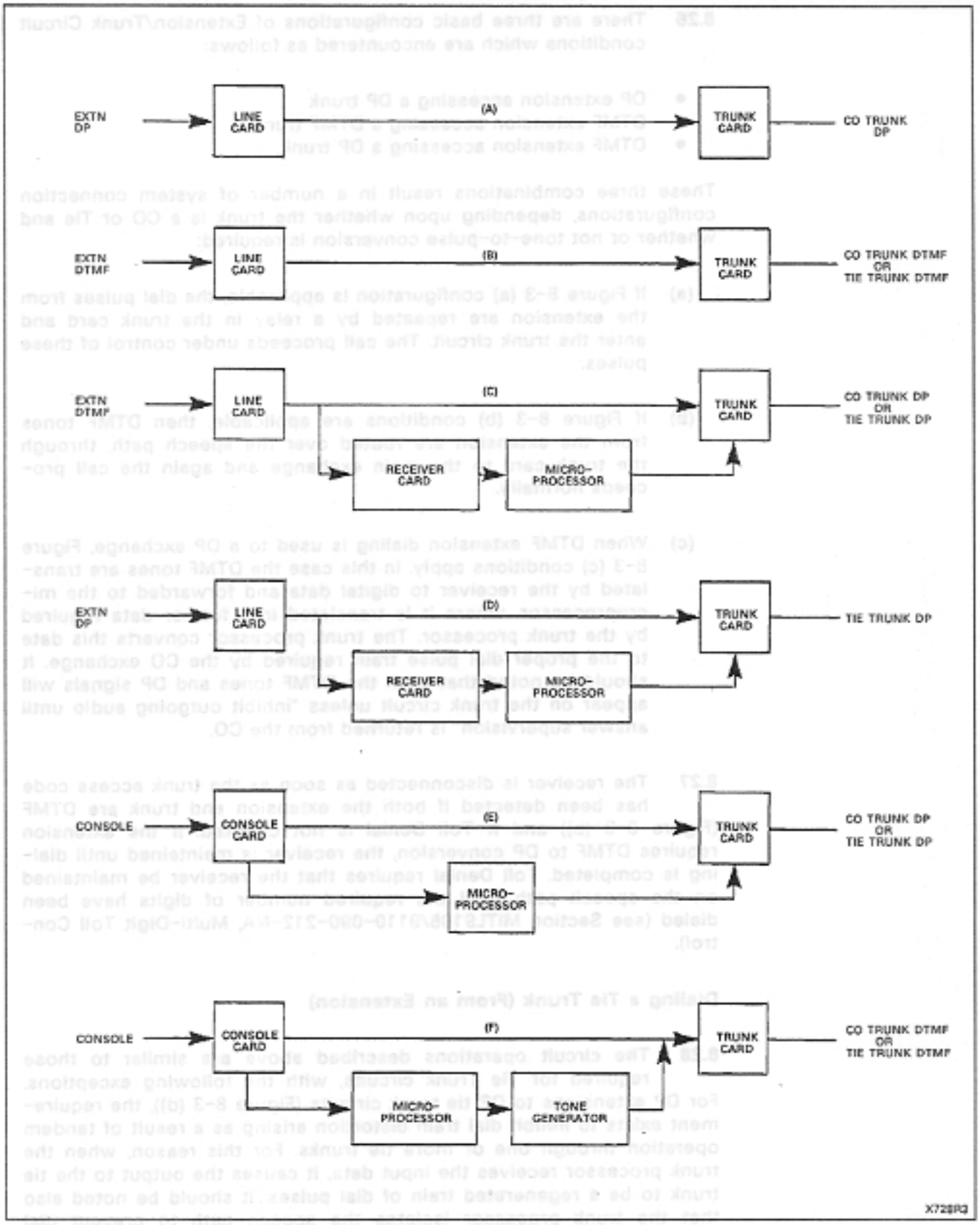


Figure 8-3 Trunk Dialing Configurations

Dialing a Trunk (From a Console)

8.29 As noted in 8.15 (Dialing Internally (From a Console)), the console dial pad produces digital signals which are stored by the microprocessor. After the trunk access code has been dialed, the subsequently keyed data signals are forwarded to the microprocessor where, after decoding, they are forwarded to the trunk card and outpulsed to the trunk line. Figure 8-3 (e) illustrates this circuit. Note that a receiver card is not required for this configuration.

8.30 If the circuit is programmed as a DTMF trunk circuit, a tone generator will be inserted as illustrated in Figure 8-3 (f). This results in the digital data signals being translated into DTMF tone pulses which are then placed on the speech path (not into the trunk card) and forwarded to the trunk circuit for outward transmission. The audio path is isolated back to the console when the DTMF transmission takes place.

Console Data Updating

8.31 The console indicators are refreshed and/or updated continuously every 100 ms by the firmware. These indicators include the 7-segment displays for the time-of-day clock, the source and destination readouts and the calls waiting display, as well as over 200 LEDs.

8.32 The status of each of these indicators is maintained in the volatile RAM. Every 100 ms, the processor addresses the RAM on the console control card and sends it 64 bytes of information for each of the two consoles. This data is then sent through the UART, where it is changed from parallel to serial data, and along a pair of wires to the console.

8.33 In the console, the information is once again clocked into a UART to be transformed into parallel data and stored in a RAM. At this point, the console's microprocessor takes control and sorts this input file into the form required to turn on/off the matrix of LEDs and the console ringer.

D. Power Supplies

8.34 The operation of the SX-100 and SX-200 ACD power supply arrangements are described in the following paragraphs.

Power Supply, SX-100

8.35 The SX-100 power supply is mounted to the right-hand side of the SX-100 card file. It is a fully RFI-shielded switching power supply consisting of the following sections:

- AC/DC Converter
- DC/DC Converter
- Ringing Generator
- Out-of-Tolerance Detector.

8.36 The AC/DC converter is designed to operate with an input of 115 Vac, 44-64 Hz and produces a controlled output of 53 Vdc. This 53 Vdc source is supplied to the DC/DC converter where it generates the following output voltages:

- +8 volts 5%
- -5 volts 5%
- -10 volts 5%.

When these voltages are within tolerance, a signal is sent to the AC/DC converter which turns on the 48 Vdc regulator. The regulator provides split DC outputs of -48 volts (-48 V1) and -48 volts (-48 V2).

8.37 A backup DC power source of between 42 to 56 Vdc may be connected to the SX-100 power supply. This voltage is also sensed by the out-of-tolerance circuit and will activate the 48 Vdc regulator. Out-of-tolerance voltages will turn off the regulator under power failure conditions.

8.38 An out-of-tolerance (OOT) circuit constantly monitors all voltage levels and should a deviation occur the power fail transfer circuits are activated.

8.39 The ringing generator uses the -48 V2 output to derive a 90 Vrms 20 Hz supply for use within the system for ringing and message waiting purposes. A fused output is available to provide ringing for night bells.

Power Supply, SX-200

8.40 The SX-200 power supply is housed in a metal cabinet which forms the lower rear door of the SX-200 cabinet. It is a fully RFI-filtered switching power supply comprising the following basic sections:

- AC/DC Converter
- Preregulator
- DC/DC Converter
- Ringing Generator
- Out-of-Tolerance Detector.

8.41 The AC/DC converter is designed to operate with an input of either 115 Vac 60 Hz or with an adapter for 230 Vac 60 Hz to produce an output of 60-64 Vdc which is supplied as an input to the DC/DC converter through a bridge rectifier.

8.42 Because the AC/DC converter has a minimum input capacitance of 0.08 Farad, a somewhat high current flow could be expected on power-up. Therefore a preregulator is placed ahead of the capacitors to slow down this charging process. The preregulator then maintains the basic DC level to between 60 and 64 Vdc.

8.43 The −64 Vdc volts is fed to the main DC/DC converter and to a control voltage supply. The DC/DC converter may also be fed by a 48 Vdc battery. Since the DC level from the bridge rectifier is greater than −48 Vdc volts when AC is applied (−60 V to −64 V), the battery supply may be connected permanently to allow instantaneous cut-in should the AC power fail. The control voltage supply generates a number of levels which are used to operate the main converter. The main converter produces the following DC voltages required by the SX-200:

- +8 volts (+8 V1)
- +8 volts (+8 V2)
- −5 volts
- −10 volts
- 0 volts (chassis ground)
- −48 volts (−48 V1)
- −48 volts (−48 V2).

8.44 These levels are regulated within 5% except for the −48 Vdc which may vary by 10%. An out-of-tolerance (OOT) circuit monitors all levels continuously and should an out-of-tolerance deviation occur, the output of this circuit is used to activate the power fail transfer circuitry.

8.45 The ringing generator uses one of the −48 Vdc outputs from the main converter to produce a 90 volt, 20 Hz supply which is used within the system (ringing, message waiting) and which is also accessible for night bells, etc.

Reserve Power Supplies

8.46 The ACDs are designed to operate from a 48 Vdc source. This source is provided from the power supply, contained within the SX-100 or SX-200 equipment and which operates from a 115 Vac (optionally 230 Vac) commercial source. A reserve power supply can be provided to supply 48 Vdc in the case of commercial power failure. The reserve power supply consists of two major assemblies as follows, which are differently packaged to meet the SX-100 (8.47) and SX-200 (8.48) requirements. A battery pack of eight batteries providing 48.3 Vdc at 20°C. A temperature-compensated battery charging unit operating from the commercial main source and which maintains the proper battery voltage.

SX-100 Reserve Power Supply

8.47 The SX-100 reserve power supply consists of a single enclosed assembly. This assembly forms the base unit upon which the SX-100 cabinet may be mounted, and is supplied with a cable harness to interconnect the 48 Vdc supply between the two units. In the case of the wall-mount version of the SX-100, the reserve power supply can be installed adjacent to the SX-100, but will require a locally fabricated cable harness to interconnect the ACD and the reserve power supply. The SX-100 reserve power supply is 635 mm (25 in.)

wide, 470 mm (18.5 in.) deep, 203 mm (8 in.) high and weighs 49.4 kg (108 lb).

SX-200 Reserve Power Supply

8.48 The SX-200 reserve power supply is intended for installation within the lower portion of the cabinet. The battery pack is contained within a shelf unit which is mounted immediately below Shelf Unit 1; and the charging unit is mounted from the rear of the cabinet. The battery supply is housed in a completely enclosed shelf measuring 178 mm (7 in.) high, 483 mm (19 in.) wide, 381 mm (15 in.) deep, and weighing approximately 43 kg (95 lb). The charging unit measures 127 mm (5 in.) wide, 178 mm (7 in.) high, 355 mm (14 in.) deep and weighs 6.4 kg (14 lb).

8.49 In the event of power failure with no reserve power available, or if the reserve power capability period is exceeded, the ACD's can be arranged to automatically connect a maximum of 12 Central Office trunks (six trunks for the SX-100) to preselected extensions.

8.50 In addition to the above power requirements and to prevent loss of customer data in the event of a power failure, the memory holding the data (non-volatile) is equipped with a reserve power supply (Ni-Cad batteries) mounted on the shelf card.

9. ELECTRICAL CHARACTERISTICS

General

9.01 This Part gives details of the electrical characteristics of the power supplies, signaling and supervisory tones, and time-out information.

Power Supplies

9.02 A summary of the electrical power characteristics is detailed in Table 9-1.

ACD Tones

9.03 A summary of the signaling and supervisory tones provided by the ACD is shown in Table 9-2. Part 10 provides data in regards to dialing and supervisory parameters. The following notes apply to Table 9-2.

Notes

1. Tolerance of call progress tone levels is 1.5 dBm.
2. Individual tones of any compound tone are within 1 dB of each other.
3. Tolerance of individual tones are 1% of the frequency stated.

TABLE 9-1
ELECTRICAL POWER CHARACTERISTICS

R1

Characteristic	SX-100	SX-200
AC Power Supplies		
Input Voltage	115 Vac or 230 Vac with adapter, -20% to +10%	115 Vac or 230 Vac, -20% to +10%
Frequency	44 Hz to 64 Hz	44 Hz to 64 Hz
Holdover Time	Momentary interruptions in commercial power-up to 250 ms duration	Momentary interruptions in commercial power-up to 250 ms duration
Input Current	4.1 A maximum at 115 Vac	4 A maximum at 115 Vac
Talk Battery Noise	Does not exceed 28 dBrnC	Does not exceed 28 dBrnC
Reserve Battery Supply		
Voltage Range	44 Vdc to 48.3 Vdc	44 Vdc to 48.3 Vdc
Holdover Time	2 hours minimum	2 hours minimum
Battery Life Time	3 to 5 yrs	3 to 5 yrs
RAM/COS Battery Pack		
Holdover Time	4 wks	4 wks
Battery Life Time	4 yrs	4 yrs
Ringing Supply		
Output Voltage	90 Vac ± 10%	90 Vac ± 10%
Frequency	20 Hz ± 1 Hz 17 Hz (Option) 25 Hz (Option)	20 Hz ± 1 Hz 17 Hz (Option) 25 Hz (Option)

Time-Out Information

9.04 Table 9-3 lists the time-out information and shows the various time-out delays which can occur under specific conditions.

10. SIGNALING AND SUPERVISION

General

10.01 This Part details the technical parameters of the ACD with regards to signaling and supervisory condition.

Dial Pulse and DTMF Tone Data

10.02 The ACD is capable of accepting and repeating signals from telephone sets which have the parameters shown in Table 10-1, Dial Pulse Limits, and 10-2, DTMF Tone Limits.

10.03 When any of the frequencies shown in Table 10-2 are present at the system input, any other single frequency (200-3400 Hz) should be a minimum of 40 dB below the former. However, DTMF pulses are registered, in the presence of precise dial tone at a level of -10 dBm.

TABLE 9-2
PABX TONES R1

Dial Tone	350/440 Hz, continuous, -13 dBm
Transfer Dial Tone	350/440 Hz, 3 bursts 100 ms on, 100 ms off followed by continuous tone, -13 dBm
Busy Tone	480/620 Hz, interrupted at 60 ipm, -24 dBm
Special Busy Tone	350/440 Hz at 60 ipm, -13 dBm
Standard Ringback Tone	440/480 Hz, 1 s on, 3 s off, -19 dBm
Special Ringback Tone	440/480 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off, -19 dBm
Reorder Tone	480/620 Hz, interrupted at 120 ipm, -24 dBm
Camp-On Tone	440 Hz, one burst of 200 ms, -16 dBm (when extension camps on) 440 Hz, 100 ms on, 50 ms off, 100 ms on, -16 dBm (when trunk camps on)
Override Tone	440 Hz, one burst of 800 ms followed by a 200 ms burst every 6 s, -16 dBm
Supervisor Error Tone	440 Hz at 10 ips for 400 ms, -16 dBm
Conferencing Tone	440 Hz, one burst of 1 s, -16 dBm (supervisor-controlled conference)
Miscellaneous Tone	440 Hz, -16 dBm
Paging Tone	440 Hz, 200 ms, -16 dBm

TABLE 9-3
TIME-OUT INFORMATION R1

Supervisor-Timed Recall (Don't Answer)	10 s, 20 s, 30 s, or 40 s
Supervisor-Timed Recall (Camp-On)	20 s, 30 s, or 40 s
Supervisor-Timed Recall (Hold)	20 s, 30 s, or 40 s
Automatic Night Switching	20 s, 30 s, or 40 s
Dial Tone Time-Out	15 s
Interdigit Time-Out	15 s lines, 10 s trunks
Lockout Time-Out	45 s
Callback Clear Time-Out	8 hours
Callback Don't Answer Reset	6 rings
Call Park Recall	2, 3 or 4 minutes
Call Hold Recall	2, 3 or 4 minutes
Call Forwarding - Don't Answer Time-Out	10 s, 20 s, 30 s, or 40 s
Switchhook Flash	200 ms to 700 ms, 900 ms, 1100 ms or 1500 ms
Ringing Time-Out	5 minutes (1 minute programmable)
Automatic Wake-Up Ringing	6 rings, each 1 s on, 3 s off
Automatic Wake-Up Attempts	3 at 5 minute intervals

TABLE 10-1
DIAL PULSE LIMITS

R1

Parameter	Min.	Max.
Pulse Rate (pps)	8.0	12.0
Break Duration (percent)	50.0	80.0
Break Interval (ms)	41.7	100.0
Make Interval (ms)	16.7	62.5
Interdigit Time (ms)	300.0	10 s (trunks); 15 s (lines)

10.04 The ACD gives the following signaling conditions:

- Dial Pulse Conditions:
  - Pulse Rate — 9 to 11 pps
  - Break Interval — 58 to 62 percent
  - Interdigit Time — 800 ms
- DTMF Dialing Conditions:
  - Frequency Deviation — 1 percent
  - Tone Duration — Greater than 40 ms
  - Interdigit Time — Greater than 40 ms
  - Level, Low Group — Greater than −10 dBm
  - Level, High Group — Greater than −8 dBm
  - Level, DTMF Signal — Less than +2 dB
  - Level, Third Frequency — Greater than 40 dB below DTMF signal
  - Twist — Less than 4 dB

Supervisory Data

10.05 The ACD is capable of responding to or providing the following supervisory conditions:

- The ACD responds to hookswitch flashes with a duration of between 200 ms and a programmable maximum time (0.7, 0.9, 1.1 or 1.5 s), in order to activate the Transfer/Consultation/Hold/Add-On features.
- An open tip lead condition of 500 ms (optional 50 ms) or more duration on a CO trunk, will release the ACD connection.
- Momentary open loop conditions of up to 350 ms (optional 40 ms) generated by the Central Office on outgoing ACD calls, will not release ACD calls.
- ACD station hookswitch flashes of less than the maximum selected time will not be repeated towards the Central Office.
- ACD station on-hook conditions will release a trunk connection after the selected maximum time.

10.06 The ACD caters to or provides the following line and trunk parameters:

- **Station Loop.** The station loop range, including the station apparatus, can be up to a maximum of 1200 ohms.
- **Supervisor Console Range.** The supervisor console can be remotely located from the cabinet up to a maximum of 300 m (1000 ft) with 26 AWG cable.

TABLE 10-2
DTMF TONE LIMITS R1

Low Frequency (Hz)	High Frequency (Hz)		
	1209	1336	1477
697	1	2	3
770	4	5	6
852	7	8	9
941	*	0	#

Frequency deviation: ±1.5%
Signal interval (2 frequency): 40 ms (minimum)
Per frequency, minimum level: −17 dBm on line circuit
Twist, maximum (at −10): +4 to −8 dBm (High f relative to low f)

- **CO Trunk Loop.** The ACD will operate with CO trunks up to a maximum of 1600 ohms loop resistance.
- **CO Trunk Seizure.** The ACD nominal seizure resistance is 270 ohms at 30 mA.
- **CO Trunk Resistance.** In the idle state the resistance towards the ACD from the trunk circuit is not less than 40 kohms for ground start trunks and not less than 10 Mohms for loop start trunks.
- **Tie Trunk Resistance.** The maximum resistances towards the tie trunk are:
  - 2 kohms for Loop
  - 3 kohms for E&M.

11. TRANSMISSION

General

11.01 This Part specifies the ACD transmission characteristics.

Transmission Characteristics

11.02 The insertion loss at 1004 Hz is as follows:

- Line-to-Line connection: 4.5 to 5.5 dB average with a maximum 0.3 dB variation between paths.
- Line-to-Trunk connection: 0.0 to 0.5 dB average with a maximum 0.3 dB variation between paths.
- Trunk-to-Trunk connection: 0.0 to 0.5 dB average with a maximum 0.3 dB variation between paths.

The attenuation variation, relative to the 1004 Hz insertion loss, does not exceed the limits as shown in Table 11-1.

TABLE 11-1
ATTENUATION VARIATION R1

Transmission Plan	Frequency or Frequency Band (Hz)	Variation in Attenuation w/r to 1004 Hz (dB)
Line to Line	200 300 to 3000 3400	−0.1 to +0.6 −0.1 to +0.4 −0.1 to +0.6
Line to Trunk	200 300 to 3000 3400	−0.1 to +0.5 −0.1 to +0.2 −0.1 to +0.3
Trunk to Trunk	200 300 to 3000 3400	−0.1 to +0.5 −0.1 to +0.3 −0.1 to +0.3
(+) is more loss, (−) is less loss.		

11.03 Harmonic Distortion. With a 200 or 1004 Hz signal at −10 dBm, the second or third harmonic shall not exceed a level of − 55 dBm.

11.04 Intermodulation Distortion. With an input signal consisting of 900 Hz and 1004 Hz, each at −13 dBm, the rms sum of all the intermodulation products shall not exceed −50 dBm when measured at the output.

11.05 Overload. The change in attenuation when the level of a 1004 Hz signal is increased from 0 to +10 dBm shall not exceed 0.2 dB.

11.06 Return Loss. The Return Loss parameters are greater than:

(a) Line-to-Trunk Structural Return Loss
ERL 20 dB
SRL 14 dB
Measured on the trunk side (without pad) and termination in 600 ohms + 2.15 μF.

(b) Trunk-to-Trunk Return Loss (Terminal Balance)
ERL 24 dB
SRL 14 dB
Measured with 900 ohms + 2.15 μF termination.

(c) Trunk-to-Trunk Return Loss (Through Balance)
ERL 27 dB
SRL 20 dB
Measure with respect to 900 ohms + 2.15 μF termination.

(d) Line-to-Trunk nontalking condition
SRL 5 dB
With respect to 900 ohms + 2.15 μF reference.

(e) Trunk-to-Trunk nontalking condition
SRL 10 dB
With respect to 900 ohms + 2.15 μF reference.

11.07 Longitudinal Balance. All connections meet the following requirements with respect to Longitudinal Balance.

Minimum

200 Hz	1000 Hz	3000 Hz
65 dB	60 dB	54 dB

11.08 Crosstalk Attenuation. The crosstalk attenuation, or coupling loss, between any two transmission paths is as stated below. Both paths are terminated in 600 or 900 ohms as required at each end. The frequency band which applies is 200 to 3400 Hz.

Line-to-Line -75 dB minimum

Line-to-Trunk -75 dB minimum

Trunk-to-Trunk -75 dB minimum

The level of the disturbing signal is 0 dBm.

11.09 Message Circuit Noise. The total level of all noise sources within the system does not exceed the following limits:

Line-to-Line +16 dBrnC (message weighted)
+35 dBrn flat (3 kHz weighted)

Line-to-Trunk +16 dBrnC (message weighted)
+35 dBrn flat (3 kHz weighted)

Trunk-to-Trunk +16 dBrnC (message weighted)
+35 dBrn flat (3 kHz weighted)

Impulse noise in the voice band results in zero counts at a threshold level of 46 dBrnC.

11.10 System Impedances. System impedances are:

- 600 ohms nominal for lines
- 600/900 ohms nominal for trunks.

11.11 Envelope Delay. The delay difference is less than 200 s between 400-3200 Hz.

12. TRAFFIC CONSIDERATIONS

General

12.01 This Part provides background data in determining the following parameters for the ACDs under various traffic loading conditions:

- Level of traffic per line (ccs per line), and quantities of receivers required.

Intercom Traffic

12.02 In determining the Intercom Traffic values and expressing these values as ccs per line figures, the following assumptions are made:

- Total Traffic (T) is 763 ccs.
- Originating Traffic equals the terminating traffic and is equivalent to 50 percent of total traffic, i.e., 381.5 ccs.
- The Intercom Originating Traffic (To) can be expressed as a percentage X of the Originating Traffic.
- Total Traffic divided by the number of lines results in a traffic per line (ccs/line) figure.
- Intercom Traffic expressed as ccs/line must have the Intercom Traffic divided by (number of lines divided by 2). This doubling of ccs/line derives from the fact that two lines are involved for each intercom call.
- The number of lines are expressed as N.

12.03 The total traffic can thus be expressed as the sum of:

Terminating Traffic	T/2
Originating Traffic – Intercom Originating Traffic	(T/2–XT/2)
Intercom Originating Traffic	XT/2

This total is T.

12.04 The ccs/line is dependent on the proportion of Intercom Originating Traffic XT/2 and the number of lines (N). Table 12-1 shows various intercom traffic levels expressed as percentages of originating traffic for different values of installed lines. Taking an example of 30 percent with 80 installed lines and applying these values the ccs/line is obtained as follows:

$$\text{ccs/line} = \frac{T}{2N} + \frac{(T - XT)}{2N} + \frac{2XT}{2N}$$

$$= 4.768 + 3.338 + 2.861$$

$$\text{ccs/line} = 10.967$$

Receiver Provisioning

12.05 The number of receivers required to be installed in the ACD is dependent on various factors, such as the number of lines and trunks installed and the amount of traffic flow estimated for the system.

12.06 In order to arrive at the quantity required for a particular installation, the following assumptions are made:

- Required grade of service:
  ABSBH: 98.5% of all receiver requests are serviced within 3 seconds.

- Traffic: 6 ccs/line ABSBH
  50% originating
  120 s average holding time.

- Average holding time for a DP receiver = 1.5 s/digit.

- Average holding time for a DTMF receiver = 0.8 s/digit.

- All receivers except one are used only for originating calls. One receiver is allotted for all other uses such as diagnostics.

- Call originations are Poisson, holding times are exponential, queue discipline is random.

- All lines originating intercom calls are DP.

- All lines originating trunk calls are DTMF and require tone-to-pulse conversion.

- All originating trunk calls involve one digit to get an outgoing trunk, a 1 second wait, then seven digits. The receiver is seized on origination and is held until 10 seconds after the last digit is punched.

- All stations have 4-digit numbers.

- A receiver can interpret either DP or DTMF.

- Receivers are provisioned in groups of two (Note 3).

- There is no delay in connecting an idle receiver to an originating line.

12.07 With the foregoing assumptions and under the following conditions, the required quantities of receivers are as shown in Table 12-2.

- Cases of 40, 80, 120 and 160 line ACDs.

- Degrees of Intercom Traffic expressed as 0, 10, 20, 30, 40 and 50 percent of Originating Traffic.

12.08 Tables 12-3 to 12-6 inclusive, show quantities of receivers required under particular traffic conditions, for differing quantities of installed lines and trunks and proportions of Intercom Traffic. The information in these Tables have been derived from the traffic calculation formulas shown in Appendix 1.

DTMF Generator Provisioning (SX-200)

12.09 Two DTMF generators are provided on the Tone Control card. The probability of a generator being available for use within 1 second after initiation of a call is calculated to be 0.996. This probability is calculated for the following assumptions, with the calculations detailed in Appendix 1.

- Traffic: 5.55 ccs/line
  38% outgoing
  180 s average holding time
- Installed stations: 140
- DTMF pulse times: 75 ms on/75 ms off
- Average number outpulsed digits: 11

TABLE 12-1
INTERCOM CCS/LINE TRAFFIC R1

Intercom Traffic (Percentage of Originating Traffic)	CCS/Line 40 Lines	CCS/Line 80 Lines	CCS/Line 120 Lines	CCS/Line 160 Lines
0	19	9.5	6.3	4.7
10	20	10	6.6	5
20	20.9	10.5	7	5.2
30	21.9	10.9	7.3	5.5
40	22.9	11.5	7.6	5.7
50	23.8	11.9	7.9	5.9

TABLE 12-2
RECEIVER QUANTITIES R1

System Size	% Intercom Traffic	No. of Receivers Required
40	0	4
	10	4
	20	4
	30	4
	40	4
	50	4
80	0	6
	10	6
	20	6
	30	6
	40	4
	50	4
120	0	6
	10	6
	20	6
	30	6
	40	6
	50	6
160	0	8
	10	8
	20	6
	30	6
	40	6
	50	6

TABLE 12-3
GENERAL BUSINESS HEAVY TRAFFIC

R1

Line Size	CCS Line	Total CCS	Intra CCS	2-Way Trunks	Receiver
30	6.9	207	35	11	4
34	6.7	227	42	12	4
38	6.5	247	48	12	4
42	6.4	268	55	13	4
46	6.3	288	62	13	4
50	6.2	309	69	14	4
54	6.1	329	76	14	4
58	6.0	350	83	15	4
62	6.0	370	90	15	4
66	5.9	390	97	16	6
70	5.9	411	105	16	6
74	5.8	431	112	17	6
78	5.8	452	120	17	6
82	5.8	472	128	18	6
86	5.7	493	135	18	6
90	5.7	513	143	19	6
94	5.7	534	151	19	6
98	5.7	554	159	20	6
100	5.6	564	163	20	6
120	5.6	666	196	23	6
140	5.5	769	228	25	6

TABLE 12-4
GENERAL BUSINESS LIGHT TRAFFIC

R1

Line Size	CCS Line	Total CCS	Intra CCS	2-Way Trunks	Receiver
30	1.8	54	5	5	2
34	1.8	61	5	6	2
38	1.8	67	6	6	2
42	1.7	73	6	6	2
46	1.7	78	7	6	4
50	1.7	84	8	7	4
54	1.7	90	8	7	4
58	1.6	96	9	7	4
62	1.6	101	9	7	4
66	1.6	107	10	8	4
70	1.6	112	11	8	4
74	1.6	117	11	8	4
78	1.6	123	12	8	4
82	1.6	128	12	9	4
86	1.5	133	13	9	4
90	1.5	138	14	9	4
94	1.5	143	14	9	4
98	1.5	148	15	9	4
100	1.5	151	15	9	4
120	1.5	176	18	10	4
140	1.4	200	21	11	4
160	1.4	223	24	12	4

TABLE 12-5
HOTEL/MOTEL HEAVY TRAFFIC R1

Line Size	CCS Line	Total CCS	Intra CCS	2-Way Trunks	Receiver
30	4.5	134	53	7	4
34	4.1	140	53	7	4
38	3.8	145	54	7	4
42	3.6	151	54	8	4
46	3.4	156	55	8	4
50	3.2	161	55	8	4
54	3.1	167	56	8	4
58	3.0	172	56	9	4
62	2.9	177	57	9	4
66	2.8	183	57	9	4
70	2.7	188	58	9	4
74	2.6	193	58	9	4
78	2.5	199	59	10	4
82	2.5	204	59	10	4
86	2.4	209	60	10	4
90	2.4	215	60	10	4
94	2.3	220	61	11	4
98	2.3	226	61	11	4
100	2.3	228	62	11	4
120	2.1	255	64	12	4
140	2.0	282	66	13	4
160	1.4	309	69	14	4

TABLE 12-6
HOTEL/MOTEL LIGHT TRAFFIC R1

Line Size	CCS Line	Total CCS	Intra CCS	2-Way Trunks	Receiver
30	.5	15	2	3	2
34	.5	17	2	3	2
38	.5	19	2	3	2
42	.5	21	2	3	2
46	.5	23	2	4	2
50	.5	26	3	4	2
54	.5	28	3	4	2
58	.5	30	3	4	2
62	.5	32	3	4	2
66	.5	34	3	4	2
70	.5	36	4	4	2
74	.5	38	4	4	2
78	.5	40	4	4	2
82	.5	42	4	5	2
86	.5	44	4	5	2
90	.5	46	5	5	2
94	.5	48	5	5	2
98	.5	50	5	5	2
100	.5	51	5	5	2
120	.5	61	6	6	2

APPENDIX 1

TRAFFIC CALCULATIONS

General

A1.01 The traffic calculations for determination of receiver provisioning and for the provisioning of the DTMF generators are detailed respectively in A1.02 and A1.03 below.

Receiver Provisioning

A1.02 The Tables shown in 12.07 which reflect quantities of receivers required for the PABX (under the conditions stated), are derived in part from the following equations:

$$RT = \frac{1}{36}\ \frac{6}{120}\ \text{Intercom T} + \frac{17.4}{120}\ \frac{\text{Trunk T}}{2}$$

RT = Receiver Traffic (Erlangs)
Intercom T = Intercom Traffic
Trunk T = Trunk Traffic

$$\frac{6}{120} = \frac{\text{Receiver Holding Time (internal)}}{\text{Average Call Duration}}$$

$$\frac{17.4}{120} = \frac{\text{Receiver Holding Time (trunk)}}{\text{Average Call Duration}}$$

Select number of receivers (C)

Calculate "α" = $\frac{RT}{C}$

Using P = 0.015

$$\text{Use } \frac{T}{H} = \frac{3}{(6)\ \frac{\text{Internal T}}{T} + (17.4)\ \frac{\text{Trunk T}}{T}}$$

$$= \frac{\text{(max. delay)}}{\text{(weighting)}}$$

$\frac{T}{H}$ = Delay in multiples of average holding time

"α", and C weighting, using the delay curves, verify that the estimated number or receivers will carry the required traffic.

DTMF Generator Provisioning

A1.03 Based on the assumption shown in 12.09 the probability of a DTMF generator being available for use is calculated as under:

Average holding time of DTMF generator per call = 11 X (0.075 + 0.075) = 1.65 s.

The generator traffic (in Erlangs) is equivalent to the product of the number of call initiations and the average holding time(s) divided by 3600, i.e.

$$\text{Traffic} = \frac{\text{outgoing traffic} \times \text{average holding time}}{\text{average call length}}$$

$$= \frac{140 \times 5.55 \times 100 \times 0.38}{180} \times \frac{1.65}{3600}$$

$$= 0.075 \text{ Erl}$$

Traffic/Generator = 0.038

$$\frac{T}{H} = \frac{\text{maximum delay}}{\text{average holding time}} = \frac{1}{1.65} = 0.61$$

From tables for dimensioning of waiting systems for experimental Holding times, the probability P of being served within 1 s is 0.996.

SX-100® AND SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION SYSTEM
MULTI-DIGIT TOLL CONTROL
GENERIC ACD

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1. GENERAL

Introduction

1.01 This Section contains a description and explanation of Multi-Digit Toll Control utilized by the SX-100/SX-200. It also contains an example of the programming forms required to program an SX-100 or SX-200 for Multi-Digit Toll Control.

Reason for Issue

1.02 This practice has been issued to provide information on the SX-100/SX-200 Automatic Call Distribution Systems.

1.03 This practice consists of nine parts, the first being a brief introduction and outline of the practice.

- Part 2 is a brief general description of Multi-Digit Toll Control.
- Part 3 covers Multi-Digit Toll Control in four areas: Control Plans, Extension CORs (Class of Restriction), Trunk Group Identification, and Absorb Plans.
- Multi-Digit Toll Control is described in detail in Part 4 with the use of diagrams and an example.
- Part 5 is a brief explanation of the North American Numbering Plan.
- Part 6 is a Programming Sequence Overview covering the actual programming of a system.
- Part 7 is a functional description of all button designations for the Extended Programming mode system in the Extended Programming mode.
- Part 8 discusses Error Codes.
- Part 9 is an example of a completed set of Toll Control forms interspaced with a functional series of diagrams.

2. GENERAL DESCRIPTION

2.01 Multi-Digit Toll Control provides a method of controlling the sequence of digits which an extension may dial into a trunk. Toll Control is applied on an extension basis; that is, the control applied to digits can vary depending on which extension has accessed the trunk. Should no toll restrictions on an extension be required, the extension may be Toll-Allowed (i.e., dialing is unrestricted).

2.02 Toll Control is implemented by programming the following information:

- Control Plans
- Extension Definition
- Trunk Group Definition.

Control Plans

2.03 A Control Plan defines explicitly the sequence of digits which will be allowed or denied. This plan may deny or allow all digits dialed into a trunk. More often, however, the plan will consist of the dialing sequence which is allowed. Note again that the digit sequences may be either allow (only digits in the list can be dialed) or deny (all digits except those in the list can be dialed).

2.04 Up to 15 Control Plans may be defined. The size of these plans depends on the usage of the extended non-volatile RAM. Toll Control is available when using Automatic Wake-Up (Alarm call), Speed Call or ARS. Although the following sections of this Practice only mention restrictions placed on access to a toll network, it is also feasible to restrict on access to non-toll numbers (i.e., local calls on WATS lines).

Extension Definition

2.05 Each extension maybe assigned a Class of Restriction (COR). The COR (1, 2 or 3) links the extension to one of three Control Plans sequence of digits which can be dialed into the trunk by the extension. Control Plan assigned to that COR in that Trunk Group.

2.06 If an extension is not assigned a COR it is TOLL-ALLOWED. This will result in no dialing restriction being applied to the extension.

Trunk Group Definition

2.07 Each Trunk Group can be assigned up to three Control Plans, associated with COR 1, COR 2 and COR 3. The plan that is applied to call through the group is determined by the COR of the extension which accesses the group. Thus an extension with COR 1 will be linked to the Control Plan assigned to COR 1 in the Trunk Group, an extension with COR 2 would be linked to the Control Plan assigned to COR 2 in the Trunk Group, and an extension with COR 3 would be linked to the Control Plan assigned to COR 3 in the Trunk Group.

2.08 The Trunk Group programming also defines Absorb Plans, which cope with Central Offices that absorb some digits, either once or repeatedly. Also, "Deny on Toll Reversal" may be enabled in each Control Plan.

2.09 A COR in the Trunk Group need not be assigned a Control Plan. In this case, no restriction will be applied to an extension when an assigned Control Plan would otherwise have been in effect. Also, the same Control Plan may be assigned to more than one COR within a Trunk Group, and in more than one trunk group.

Digits Dialed

2.10 A maximum of 26 digits can be controlled for a single dialing sequence by an extension. It is possible to dial more than 26 digits, but only the first 26 would be monitored for Toll Control purposes. The Supervisor can dial a maximum of 26 digits into a trunk. Digits beyond this number will not be output to the trunk by the System. No Toll Control is ever applied to the console.

2.11 An extension dialing an illegal number will receive reorder tone or may be directed to the Supervisor after the last digit dialed.

3. ELEMENTS OF MULTI-DIGIT TOLL CONTROL

3.01 The following Part is a general description of the elements of Multi-Digit Toll Control. The description is broken down into four parts:

- Control Plans
- Extension CORs
- Trunk Group Definition
- Absorb Plans.

Control Plans

3.02 Each Trunk Group may be assigned three different Control Plans, each one linked to one of the Trunk Group's CORs. When an extension accesses a Trunk Group, the COR of the extension is matched to the Trunk Group COR and the assigned Control Plan is accessed. This allows different extensions to access different Control Plans when placing calls through the same Trunk Group (Figure 3-1). It should be noted that a completely allowed path exists in each Trunk Group. This occurs for access by fully toll-allowed extensions or if a Trunk Group has no Control Plan assigned.

Extension CORs

3.03 Each extension may be defined as Toll-Allowed or as having one of three CORs. Toll-Allowed indicates that no denial checking will be done for an extension. A COR assignment will indicate that denial checking will occur for trunk calls made from an extension. This checking will be according to the Control Plan linked to the extension's COR number within the Trunk Group. The linking of an extension's COR (in a Trunk Group) with a Control Plan is shown in Figure 3-2 using the following information:

- Extension W may access Control Plan 1 through Trunk Group A.
- Extension X may access Control Plan 1 through Trunk Group B.

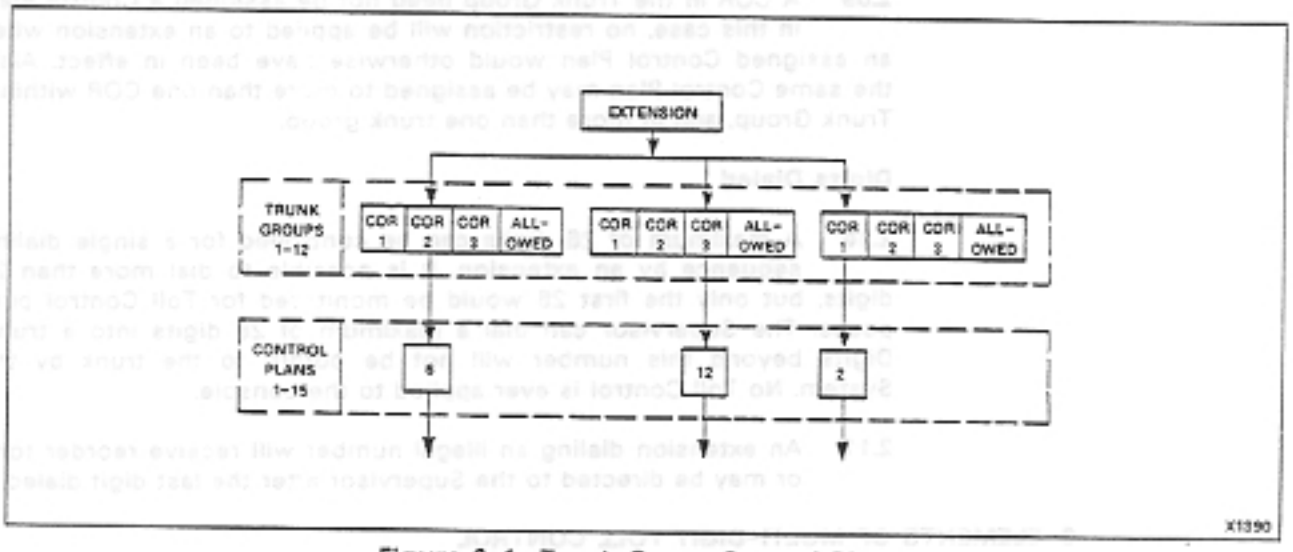


Figure 3-1 Trunk Group Control Plans

- Extension Y may access Control Plan 1 through Trunk Group B, Plan 2 through Trunk C.
- Extension Z may access Control Plan 3 through Trunk Group C and Control Plan 4 through Trunk Group D.

Trunk Group Definition

3.04 Trunk Group access is primarily controlled by an extension's Class of Service. By restricting access to certain Trunk Groups, an extension is inhibited from making some calls on a general basis. The four paths that may be used after an extension has accessed a trunk, are: COR 1, COR 2, COR 3, and Toll-Allowed. Each COR may be linked to a specific Control Plan which will define the actual digits that may or may not be allowed. The Control Plan can also specify Denial on Toll Reversal. If a trunk COR is not linked to a Control Plan, an extension accessing that COR will be Toll-Allowed.

3.05 Each defined Control Plan can be enabled to cause an unconditional denial of a call if a toll reversal is sensed. The first digit of the Trunk Group "type" in Standard Programming must be programmed as "3". This programming will indicate that a battery reversal on any trunk within the group signifies detection of a toll call by the Central Office.

Absorb Plans

3.06 In some localities, certain leading digits are ignored by the Central Office equipment. This is done so that less equipment will be used on local calls. Through Absorb Plans these digits may be simulated in two manners: Absorb Repeat, Absorb Unlock. An Absorb Repeat digit is continuously ignored until a Non-Absorb digit is dialed. At this time the system will enforce Toll Control. An Absorb Unlock digit is ignored only on its first occurrence. At this time the system will enforce Toll Control. Up to two Absorb Plans may be defined per

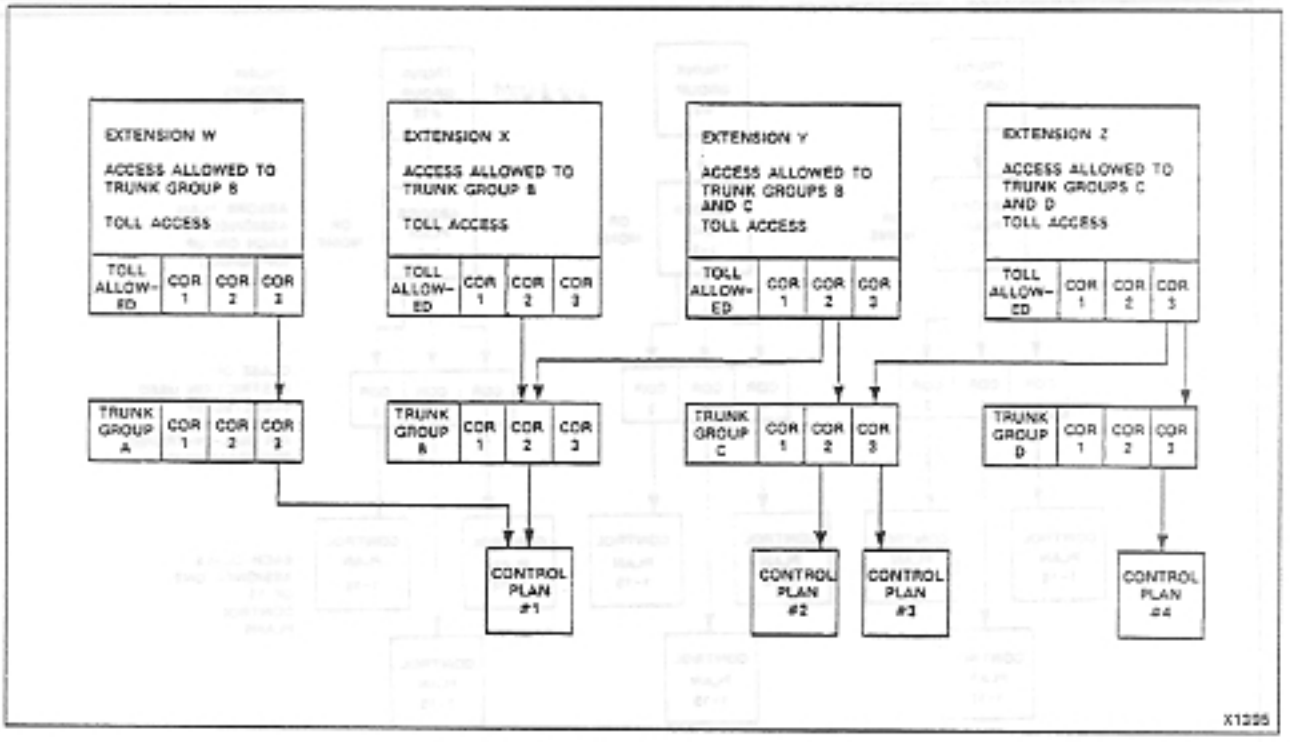


Figure 3-2 Basic Block Diagram

system. Either one or none of the two Absorb Plans may be assigned to any Trunk Group or may be assigned to more than one Trunk Group (Figure 4-1 (a)).

4. DETAILED DESCRIPTION

General

4.01 Multi-Digit Toll Control allows toll restrictions to be placed on all outgoing trunk calls on an individual extension basis. In other words, the parameters specifying toll restriction details are assigned directly to each Trunk Group used in the system. If desired, the same parameters can be assigned to more than one Trunk Group allowing identical Toll Control on different Trunk Groups. To achieve different restrictions on the same Trunk Group, different extensions may be assigned different classes of control.

4.02 The basic architecture of the Multi-Digit Toll Control is illustrated in Figure 4-1(a) and Figure 4-1(b). The architecture outlined in these figures is discussed in the remainder of this section, and it does not include the toll-allowed case.

4.03 Each extension may be defined as Toll-Allowed or as having one of three CORs (Class of Restriction). Toll-Allowed indicates that no denial checking will be done for an extension, no matter which Trunk Group is accessed. A COR assignment will indicate that denial checking will occur for trunk calls made from an extension, according

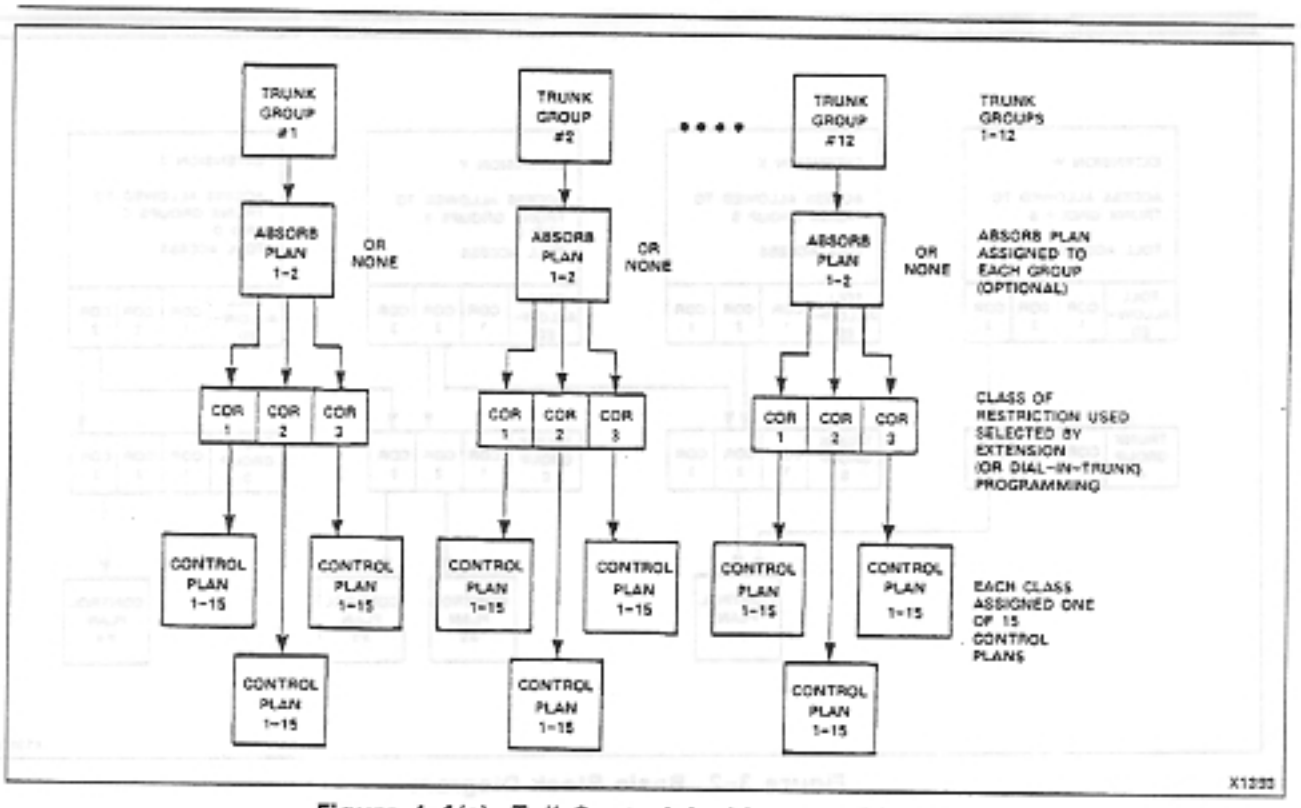


Figure 4-1(a) Toll Control Architecture Diagram

to the Control Plan linked to the extension's COR number within the Trunk Group accessed. If no Control Plan is linked to this COR of the Trunk Group, the extension will be completely allowed. It may be seen when an extension makes an outside call, the COR of the extension determines the Trunk Group Control Plan to be used.

4.04 The Trunk Group definition includes: the assignment of Absorb Plans to the Trunk Group and the association of the required Control Plans to the Trunk Group's CORs. Note: If a trunk COR is not assigned, an extension accessing COR is Toll-Allowed.

Absorb Plan

4.05 If the System is connected to a CO which absorbs specific digits, it will be necessary to define an Absorb Plan. The purpose of an Absorb Plan is to cause the System to ignore dialed digits exactly as the CO ignores them. The System can accommodate up to two independent Absorb Plans. Each plan specifies the "Absorb Repeat" digits and the "Absorb Unlock" digits. Either or none of the Absorb Plans may be selected for use by a Trunk Group. Note that the application of an Absorb Plan to a Trunk Group will never cause the System to prevent dialed digits from going to the CO. The "absorbed" digits are simply ignored by the System in terms of Toll Control checking. That is, Toll Control will be enforced after an Absorb Plan is satisfied. In this case the System will check the same digits which the CO (and toll network) acts upon. Two different types of digit absorbs are provided:

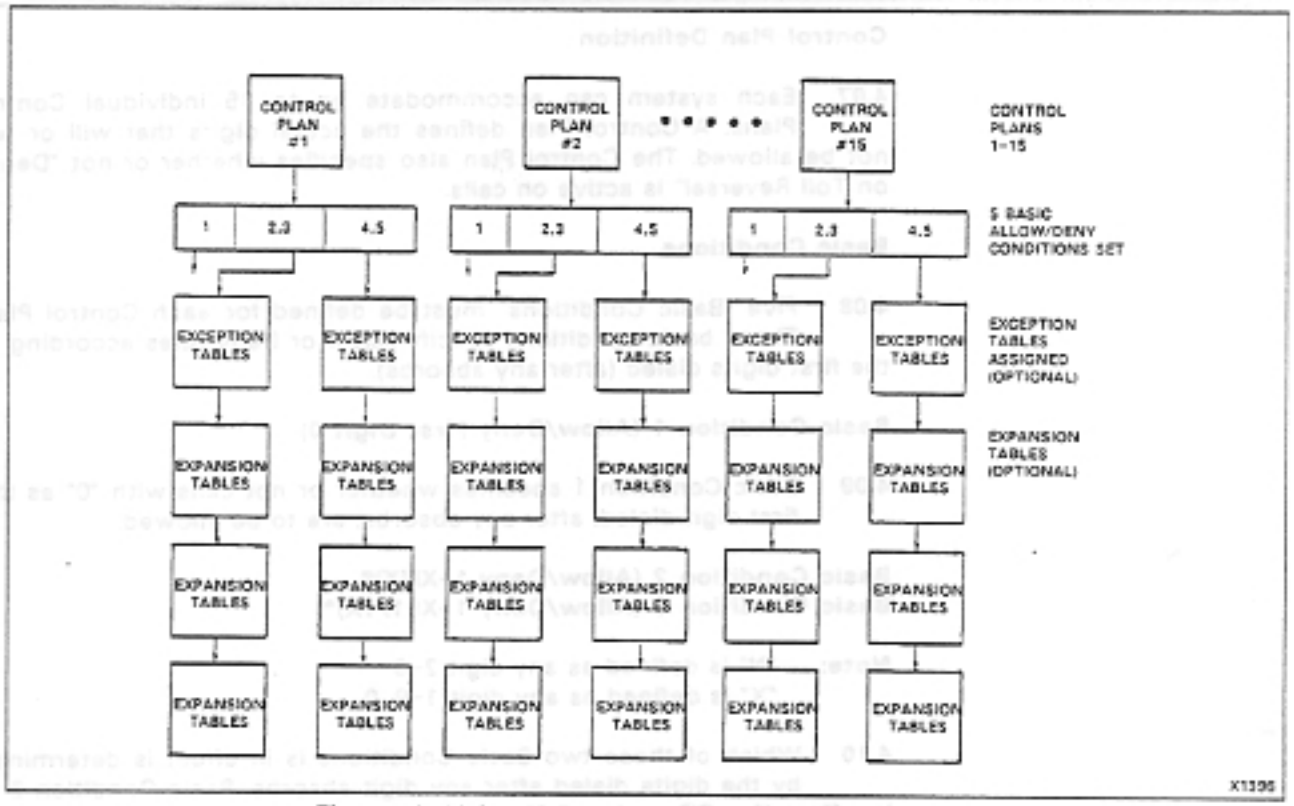


Figure 4-1(b) Toll Control Architecture Diagram

- **Absorb Repeat Digits.** The Absorb Plan may absorb up to four individual digits. When the first digit dialed on the trunk is an absorb repeat digit, it is passed without further analysis by the System. Further digits matching any of the absorb repeat digits programmed will also be ignored. When a non-listed digit is received the effects of the Absorb Plan are terminated, and the non-listed digit and all subsequent digits are not subject to the Absorb Plan.

- **Absorb Unlock Digits.** The Absorb Plan may contain up to four individual digits. When the first digit (or the digit after any absorb repeats) is one of the absorb unlock digits programmed, it is passed without further analysis by the System. At this point the Absorb Plan is unconditionally terminated, and all subsequent digits (not including the unlocking digit) are analyzed.

Control Plan Assignment

4.06 Each Trunk Group may be assigned three different Control Plans, one linked to each of the Trunk Group's CORs. When an extension accesses a Trunk Group, the COR of the extension is matched to the Trunk Group COR and the assigned Control Plan is accessed.

Control Plan Definition

4.07 Each system can accommodate up to 15 individual Control Plans. A Control Plan defines the actual digits that will or will not be allowed. The Control Plan also specifies whether or not "Denial on Toll Reversal" is active on calls.

Basic Conditions

4.08 Five "Basic Conditions" must be defined for each Control Plan. These basic conditions specify Allow or Deny rules according to the first digits dialed (after any absorbs).

Basic Condition 1 (Allow/Deny First Digit 0)

4.09 Basic Condition 1 specifies whether or not calls with "0" as the first digit dialed, after any absorbs, are to be allowed.

Basic Condition 2 (Allow/Deny 1-XNX)*
Basic Condition 3 (Allow/Deny 1-X01/1X)*

Note: "N" is defined as any digit 2-9
"X" is defined as any digit 1-9, 0

4.10 Which of these two Basic Conditions is in effect is determined by the digits dialed after any digit absorbs. Basic Condition 2 is in effect if a CO code (XNX code) is dialed after the toll prefix. Basic Condition 3 is selected if an area code (X0/1X) is dialed after the toll prefix.

4.11 These Basic Conditions may reference an Exception Table if required. This table lists any exceptions to the Basic Conditions selected. If the Basic Condition is specified as Allow, all codes will be allowed except those listed in the Table referenced. Similarly if the Basic Condition is defined as Deny, the table will list those codes which will be allowed.

Basic Condition 4 (Allow/Deny NNX)
Basic Condition 5 (Allow/Deny N0/1X)

4.12 Basic Condition 4 or 5 is in effect if an Area Code (N0/1X) or a CO Code (NNX) is dialed without the toll prefix (1) and after any digit absorbs. Basic Condition 4 is selected for CO calls. An Exception Table lists any exceptions to the basic Allow/Deny condition.

Expansion Tables

4.13 An Expansion or Exception Table consists of a listing of the codes that are exceptions to the Basic Condition from which they are referenced. The first use of a table is referred to as an "Exception Table". All following tables are "Expansion Tables" to the Exception Table. The tables may be 800-entry, 20-range, or 4-entry tables. The number of tables of each size available for assignment is shown in Table 4-1. A table may be referenced only once within the

system (Figure 4-2). Any of these tables can be represented as an Expansion or Exception Table of any level.

4.14 **800-Entry Tables.** An 800-Entry Table (Table Numbers 1-9) may consist of any or all of the 3-digit codes in the range 200 through 999.

4.15 **20-Tables.** Each range in this type of table (Table Numbers 21 through 33) consists of ten 3-digit numbers. A Range is defined as any group of entries with the first two digits the same (311, 312, 316 is considered one range, 312, 325 is considered two ranges). A maximum of 20 "ranges" may be contained in this type of table.

4.16 **4-Entry Tables.** These tables (Table Numbers 51 through 73) may hold up to four entries. Each entry may be one, two, three or four digits in length. If only a 1-, 2- or 3-digit entry is made, the restriction (Allow/Deny) will apply to all numbers beginning with the entry.

TABLE 4-1
TABLE NUMBERS

Table Type	Table Numbers Available
800-ENTRY	1-9
20-RANGE	21-33
4-ENTRY	51-73

4.17 The 4-entry table type can accommodate entries of 1 to 4 digits. Also, any digits can be stored in an entry. For example, a 4-entry table could hold the following entries:

- 2122
- 23
- 114
- 0909

Note that this table type is the only type whose entries need not be a fixed number of digits. This enables many special case toll restriction situations to be accommodated.

Table Usage and Expansion (refer to Figure 4-2)

4.18 The first tables used define the exceptions to the basic Allow/Deny conditions of the Control Plans. It is the method of the application of the exception tables which gives the Toll Control feature its flexibility. This section will explain the possibilities of using the exception tables. The actual programming of the tables will be discussed in the programming sections.

4.19 When it is determined that exceptions are required for a basic condition, a table is assigned to store the exceptions. ANY unassigned table, regardless of the type, may be assigned. Figure 5-5 shows a typical exception sequence for Control Plan 1. Here a 20-range table (Table 21) has been assigned as an Exception Table to basic conditions 2 and 3. This indicates that all 3-digit codes dialed after a "1" will be denied unless the code appears in Table 21. As shown, several area codes have been entered.

4.20 Any entry in a Table can be "expanded" with another table. The table used to expand the entry can be of any type, so long as the table is not yet assigned. An expansion has been applied to the 613 entry in the Exception Table by assigning Table 22. This indicates that 613 will only be allowed if followed by an entry in Table 22. Since the 416 entry in the Exception Table has no expansion, any digits dialed after 416 will be allowed.

4.21 When a table is assigned to a basic condition (or pair of basic conditions), it is called an "Exception Table". When a table is assigned to any entry in any other table, it is termed an "Expansion Table". Tables can be used to expand entries in other tables to any level. Each table can only be assigned to one place – either a basic condition (or pair of conditions) or an entry in another table.

4.22 The following points summarize Restriction Table capabilities and limitations:

- Any table (regardless of type) may be assigned to a Basic Condition (or pair of Conditions) in a Control Plan.
- Any table (regardless of type) may be assigned to any entry in any table.

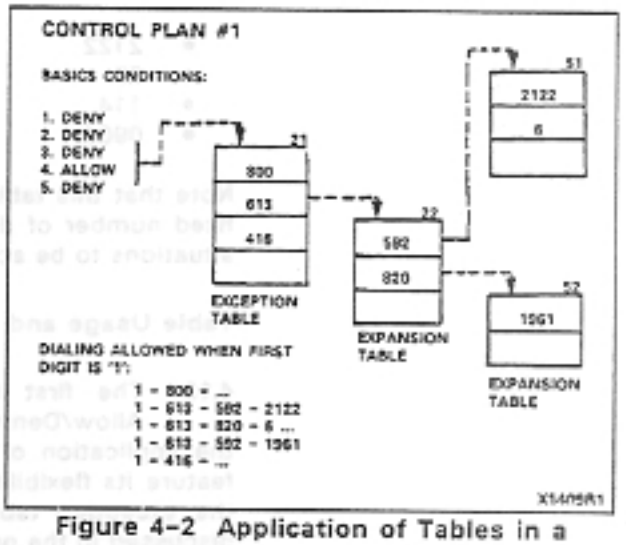


Figure 4-2 Application of Tables in a Control Plan

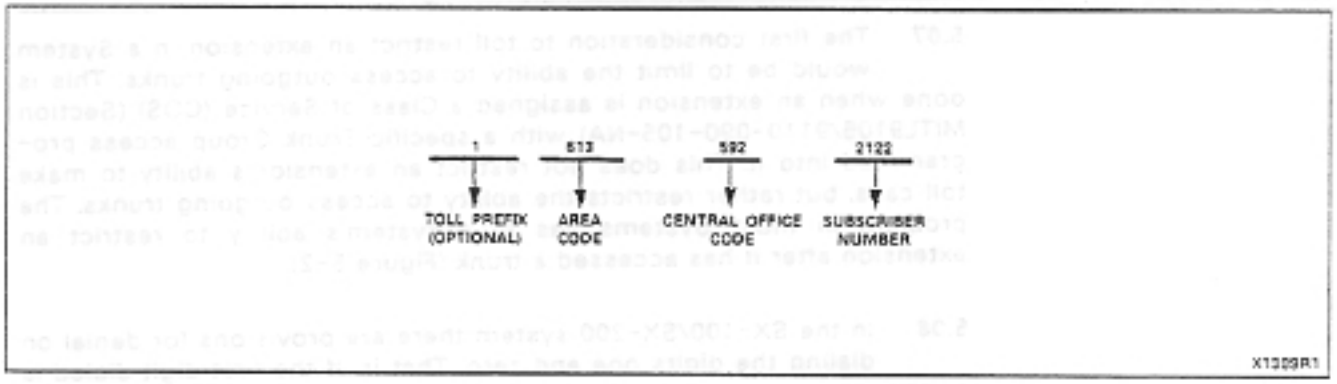


Figure 5-1 North American Plan

- A table may only be assigned to one place at a time, whether to a Basic Condition (or pair) or to another table entry.

5. NUMBERING PLAN (NORTH AMERICAN)

5.01 Almost every subscriber in the North American telephone system may access any other subscriber by dialing a maximum of ten or eleven digits. These digits consist of an optional toll prefix number (usually 1), a 3-digit area code, a 3-digit Central Office code and a 4-digit subscriber number (Figure 5-1).

5.02 In general, in the area code the first digit may be any number except one or zero. The second digit must be one or zero. The last digit may be any number zero through nine.

5.03 In general, in the CO code the first digit may be any number 2 through 9. It should be noted that there are assigned service codes such as 911 and 411 that may conflict.

5.04 The subscriber number may be any series of digits from 0000 to 9999. Once again there are assigned numbers such as 1212 and 1000 that are generally reserved for special services.

5.05 In some smaller locales a Central Office may utilize the first series of digits dialed to unlock the office. That is, the digits will be absorbed by the office, i.e., 687-6577 where the 68 will be absorbed and it is only required to dial the 7-6577. Thus 68 would be entered into an Absorb Repeat plan. There is also the situation where these digits may be automatically outpulsed in a tandem situation, making the dialing of those digits necessary.

5.06 Utilizing this information and taking into account that numbering plans exist other than the North American Numbering Plan, a difficulty in toll restriction may be observed. The problem compounds itself within a System since some extensions must be restricted and others toll-allowed when accessing different or even the same trunks. The remainder of this Part will discuss (with specific reference to the North American Numbering Plan) various methods of Toll Control that may be utilized.

5.07 The first consideration to toll restrict an extension in a System would be to limit the ability to access outgoing trunks. This is done when an extension is assigned a Class of Service (COS) (Section MITL9105/9110-090-105-NA) with a specific Trunk Group access programmed into it. This does not restrict an extension's ability to make toll calls, but rather restricts the ability to access outgoing trunks. The problem in most Systems lies in a system's ability to restrict an extension after it has accessed a trunk (Figure 5-2).

5.08 In the SX-100/SX-200 system there are provisions for denial on dialing the digits one and zero. That is, if the first digit dialed is a one or a zero, the toll denied extension will be routed to the Supervisor or will receive reorder tone (Figure 5-3).

5.09 In the examples shown in Figures 5-2 and 5-3, extension 549 is the only extension which will be permitted to dial a long distance code or access a WATS line. Extensions 338 and 347 will be restricted to local calls only, unless the Supervisor makes a long distance call and connects the extension to that trunk. Obviously the efficiency of such a system is dubious at the best of times. A Toll Control based upon the digits or sequence of digits would be preferable to the two outlined situations of 5.07 and 5.08.

5.10 The following example should be used in conjunction with the examples in the installation forms in the latter part of this practice. This Section will outline a possible implementation of the Multi-Digit Toll Control feature in an area where the toll prefix is one. The pertinent system configuration information for the example is:

- There are three Trunk Groups, Trunk Group 1 and Trunk Group 2 are CO trunks, Trunk Group 3 consists of tie trunks to another System.

5.11 It will be assumed, for Toll Control purposes, there are three classes of users served by the ACD System:

- User A: Upper Management
- User B: Sales and Marketing
- User C: All other users.

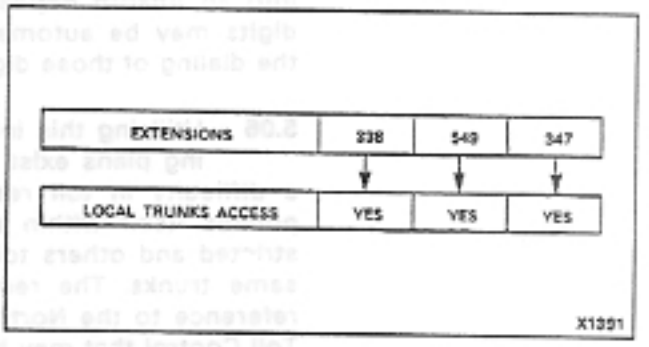


Figure 5-2 0/1, Toll Restriction

EXTENSIONS	338	549	347
LOCAL TRUNKS ACCESS	YES	YES	YES
0 OR 1 DIALING	NO	YES	NO
WATS ACCESS	NO	YES	NO

X1392

Figure 5-3 0/1, WATS, Toll Restriction

5.12 The following restrictions are desired for each user group with each Trunk Group:

- Trunk Groups 1 and 2 (local CO):
  User A: Completely allowed
  User B: Allow all calls in home area code (local and toll)
  Allow all calls to area codes 408, 209, 707
  Deny all toll calls to other area codes
  Allow toll calls to 613-592-2122
  Deny operator access
  User C: Allow local calls only (primary calling area)
  Deny operator access

- Trunk Group 3 (tie):
  User A: Completely allowed
  User B: Completely allowed
  User C: Deny Trunk access on other System (deny "9")
  Allow everything else.

First, it can be seen that no digit absorbs will be required. Therefore, no Absorb Plans need be defined or assigned to any Trunk Groups. This is shown in Figure 5-4.

5.13 The extension programming must be performed to define the paths to be taken within the Trunk Groups. Group A users will be completely allowed in all Trunk Groups, so their extensions need only be programmed with "TOLL DENY - DELETE". Group B users are only completely allowed when accessing one Trunk Group (#3), so the same thing cannot be done with this group of users. Here, we will program their extensions with "TOLL DENY 1", meaning Class of Restriction 1 will be taken in the Trunk Groups they are accessing. Similarly, Group C users' extensions can be programmed with "TOLL DENY 2" which will define the path taken when Group C users access a Trunk Group.

5.14 At this point, the major paths taken in any trunk-dialing instance have been defined. The Control Plans needed must now be assigned and programmed. A different Control Plan is needed for each different allow/deny requirement of the Levels of Restriction.

Figure 5-4 shows a possible Control Plan assignment. Note that even though Class of Restriction 3 is not actively used, it must be assigned a Control Plan number. In this case it has been assigned the same Control Plan as Level of Restriction.

5.15 The only remaining task is to define the Control Plans. Figure 5-5 shows the set-up for Control Plan 1. Figure 5-6 shows Control Plan 2. The type of any digit tables used can be found by noting the table number and referring to Table 4-1.

5.16 As can be seen, any Control Plan could become quite complicated, thereby allowing a restriction capability closely tailored to a particular installation's requirements. Generally, the maximum feature capability is limited by the number of tables available. Careful planning is necessary before programming the feature to eliminate duplication of Control Plans (and therefore digit tables) and ensure efficient usage of the digit tables.

6. PROGRAMMING SEQUENCE

6.01 This Part discusses the actual method for Multi-Digit Toll Control Programming. It should be used in conjunction with Part 7 Functional Description, the Programming Tables and the MAPs.

6.02 There are 11 basic steps in a complete programming of Multi-Digit Toll Control. These are:

- Complete Forms Volume 3
- Enter Standard Programming Mode
- Initialize the Non-Volatile RAM (if necessary)
- Program Extensions and Dial-In Trunks for COR
- Enter Extended Programming Mode
- Program Absorb Plans
- Program Trunk Groups
- Program Control Plans
- Program Restriction Tables
- Terminate Programming.

6.03 All forms in Volume 3 (Installation Forms) should be completed before attempting to program the system for Multi-Digit Toll Control. All Standard Programming should be completed before attempting to program the system for Multi-Digit Toll Control. Section MITL9105/9110-090-210-NA should be consulted when programming Extension COR.

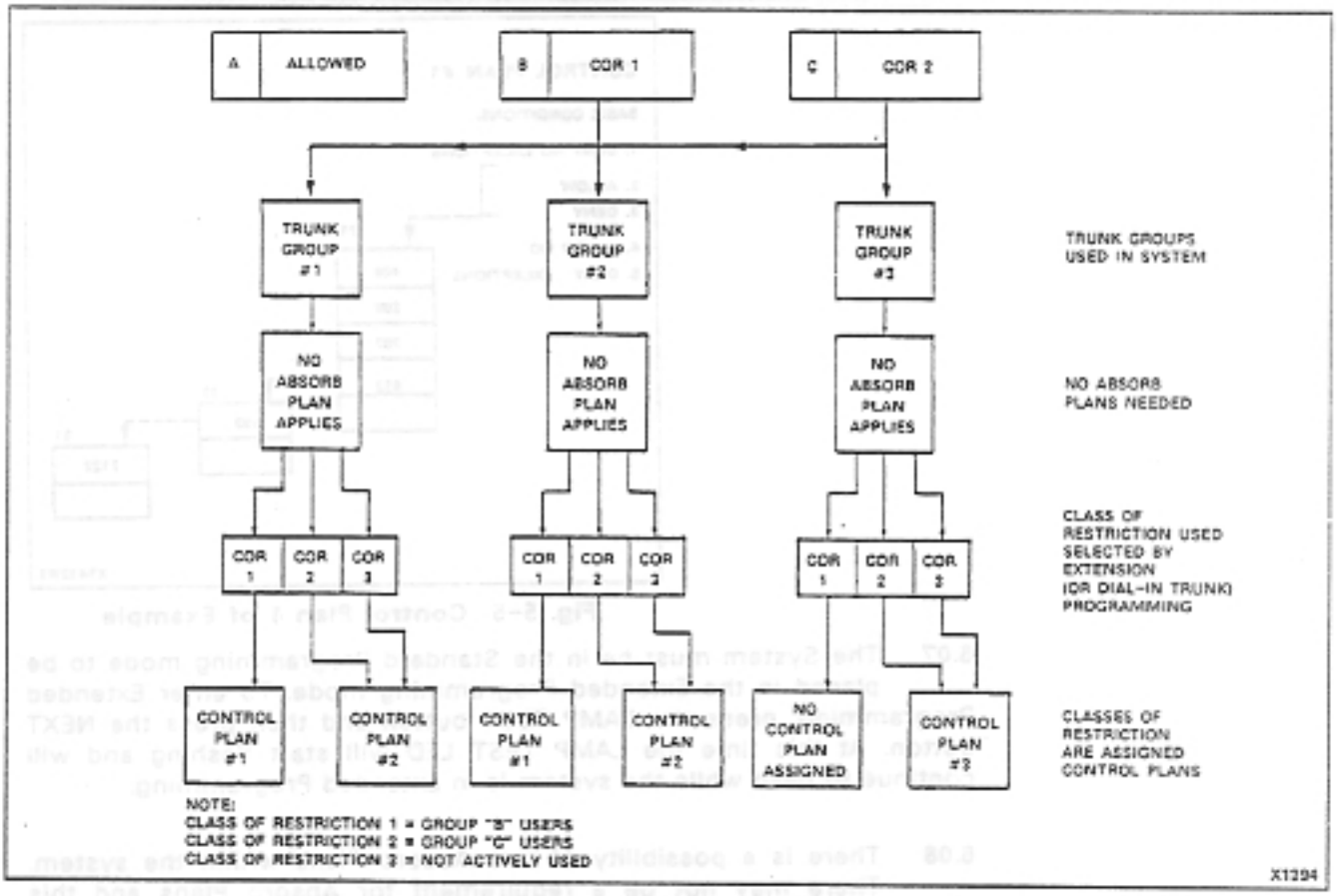


Figure 5-4 Diagram of Basic Toll Control Paths

6.04 The System is put in Standard Programming mode following the procedure outlined in Section MITL9105/9110-090-210-NA. It should be noted that the Standard System Programming must include System Option 292 (Toll Control Enable). If this option is not selected, the system will default to a 0/1 type of Toll Control.

6.05 If Multi-Digit Control is to be programmed for the first time or to be totally reprogrammed, the system's RAM must be initialized. AN IMPORTANT POINT: if the RAM is initialized, all RAM data will be destroyed. Initialization may be accomplished as per Section MITL9105/9110-090-210-NA. This operation should only be performed during times of no traffic.

6.06 All extensions must be assigned a Class of Restriction or be completely Toll-Allowed. This is done by the following sequence: select Standard Programming console overlay, press EQPT NUMBER button, dial the extension number, press the TOLL DENY button, dial 1, 2 or 3 (for COR 1, 2 or 3), or press the DELETE button (for Toll-Allowed). At the end of each entry for the extensions or Dial-In Trunks, the ENTER button must be pressed. If System Option 292 (Multi-Digit Toll Control Enable) is not selected an EO error will result, if 1, 2 or 3 is not dialed as a COR.

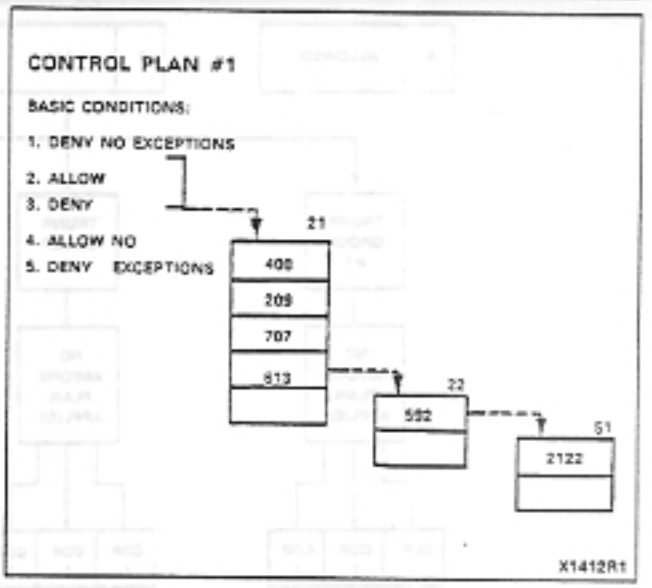


Fig. 5-5 Control Plan 1 of Example

6.07 The System must be in the Standard Programming mode to be placed in the Extended Programming mode. To enter Extended Programming, press the LAMP TEST button and then press the NEXT button. At this time the LAMP TEST LED will start flashing and will continue to flash while the system is in Extended Programming.

6.08 There is a possibility of two Absorb Plans within the system. There may not be a requirement for Absorb Plans and this section of the Programming sequence overview may be ignored if such is the case. Some important points to recall about Absorb Plans are listed below:

- Each Trunk Group may be assigned one of two Absorb Plans.

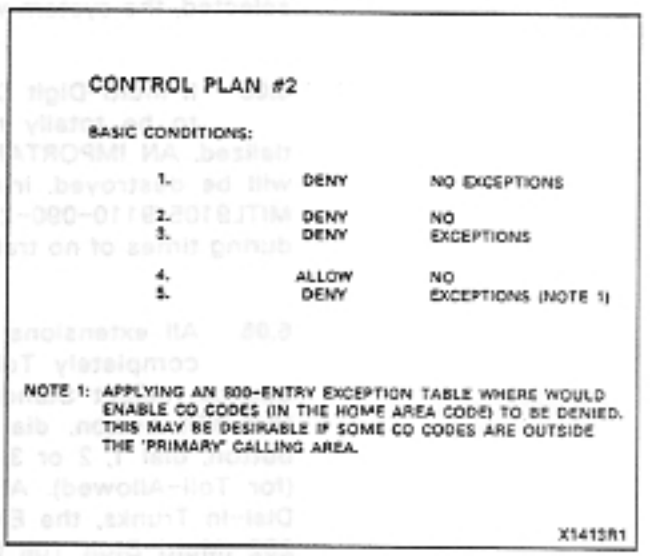


Fig. 5-6 Control Plan 2 of Example

- The same Absorb Plan may be assigned to more than one Trunk Group.

- Up to four "digit absorb repeat" digits are allowed in each plan.

- Up to four "digit absorb unlock" digits are allowed in each plan.

- It is not possible to specify a 2- (or more) digit sequence. Each of four digits is referenced independently of an extension that accesses that Trunk Group. The Toll Control process will follow the path specified by the extension's COR. The extension COR will select a COR path within the Trunk Group that will have a Control Plan assigned to it (Figure 3-2). One of fifteen Control Plans may be assigned to a COR and the same Control Plan may be assigned to more than one Class of Restriction. Each defined Control Plan can be enabled to cause an unconditional denial of a call if a toll reversal is sensed. Note that the first digit of the Trunk Group "type" must be programmed as "3" to indicate that a reversal on the trunk represents toll call detection by the Central Office.

6.09 The Control Plan contains the basic Allow/Deny information. This includes information for denying if a "Toll Reversal" is sensed, and five "Basic Conditions" of Allow/Deny. The Control Plan also designates any required table(s) of exceptions to the five basic conditions.

6.10 The basic Allow/Deny conditions fall into three groups and only one of these groups will be involved in any single dialing instance. The three groups and the basic Allow/Deny conditions listed as (1 through 5) are as follows:

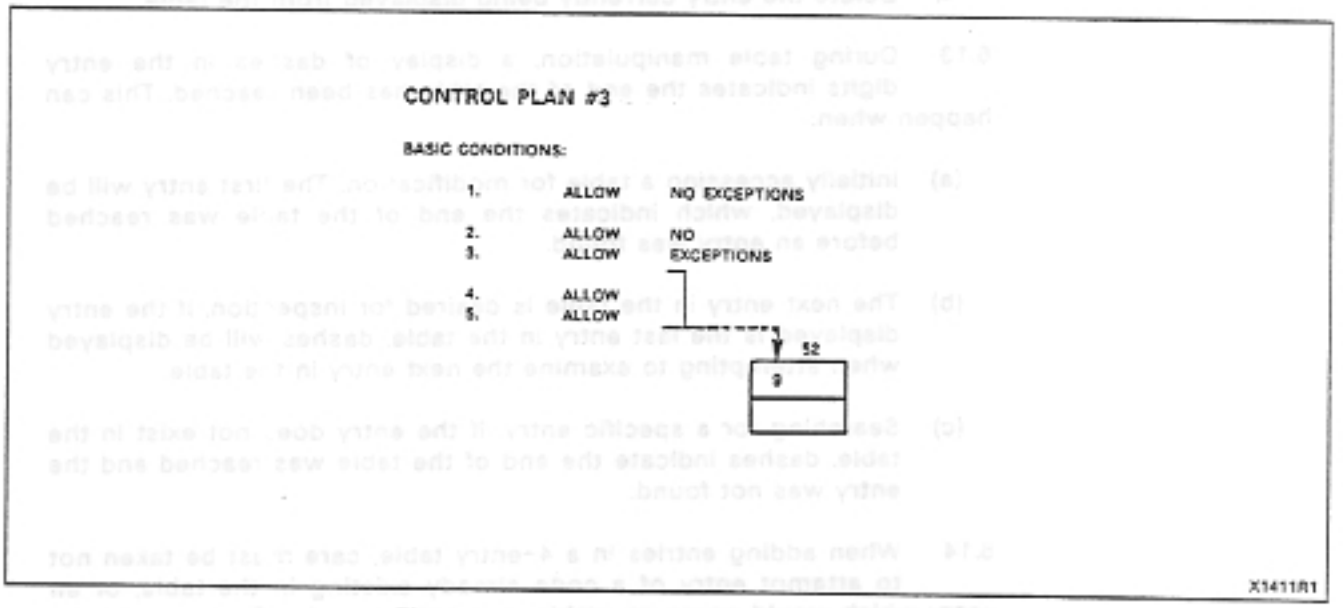


Figure 5-7 Control Plan 3 of Example

(a) First digit (after absorbs) is a 0

1. Allow/Deny 1st digit 0.

(b) First digit (after absorbs) is a 1

2. Allow/Deny 1-XNX
3. Allow/Deny 1-X0/1X.

(c) First digit (after absorbs) is a 2-9

4. Allow/Deny NNX
5. Allow/Deny N0/1X.

6.11 **Initializing a Table.** If a table which was previously in use is required for different entries, it may be cleared of all entries and expansions via initialization. The suggested programming form shows the procedure.

6.12 **Examining and Adding/Deleting Table Entries.** Tables may be manipulated on an entry basis. Inspecting the programming procedure form for table manipulation will reveal that there are four basic entry operations once the table number has been entered and DISPLAY ENTRY button has been pressed:

1. Display next entry in table.

2. Search for specific entry.

3. Add a specific entry to the table, including an optional table number of an expansion to the entry.

4. Delete the entry currently being displayed from the table.

6.13 During table manipulation, a display of dashes in the entry digits indicates the end of the table has been reached. This can happen when:

(a) Initially accessing a table for modification. The first entry will be displayed, which indicates the end of the table was reached before an entry was found.

(b) The next entry in the table is desired for inspection. If the entry displayed is the last entry in the table, dashes will be displayed when attempting to examine the next entry in the table.

(c) Searching for a specific entry. If the entry does not exist in the table, dashes indicate the end of the table was reached and the entry was not found.

6.14 When adding entries in a 4-entry table, care must be taken not to attempt entry of a code already existing in the table, or an entry which would cause an ambiguous entry to exist. For example, the

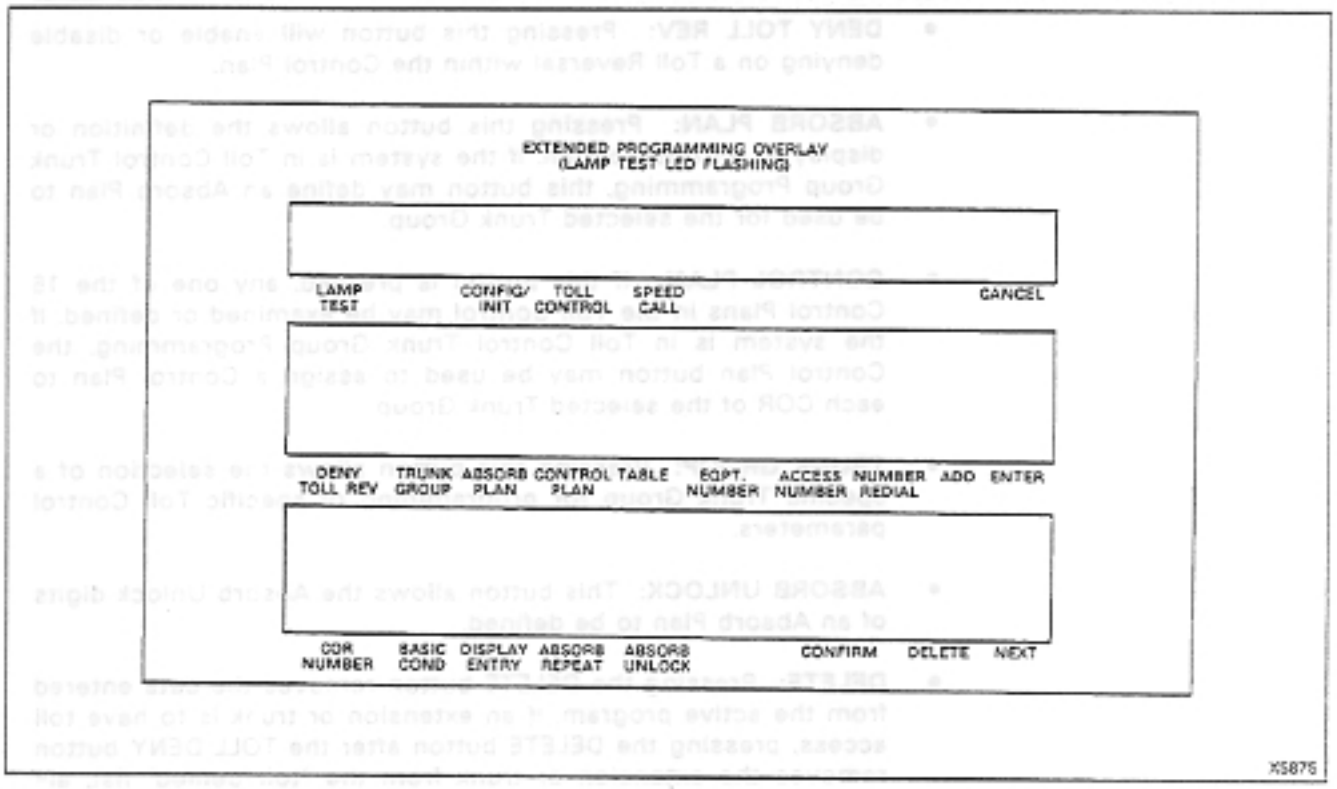


Figure 7-1 Extended Programming Console Overlay

two entries 46 and 461 cannot exist simultaneously in a 4-entry table. For 800-entry and 20-range tables, adding an existing entry has no effect and ambiguous entries cannot exist because all entries must be three digits in length for these table types.

6.15 Extended Programming may be terminated by pressing the LAMP TEST button followed by the NEXT button. At this time the LAMP TEST LED will stop flashing and Standard Programming will be entered. To exit from programming mode see Section MITL9105/9110-090-210-NA.

7. FUNCTIONAL DESCRIPTION

7.01 The Extended Programming console faceplate layout is shown in Figure 7-1. The faceplate differs from other programming faceplates, in that certain buttons bear different designations required for Multi-Digit Toll Control. For a brief description of each button and its function, see the appropriate description, as follows:

- **CONFIG/INIT.:** Pressing this button allows the extended non-volatile RAM to be initialized and the proper configuration to be selected.
- **TOLL CONTROL:** Pressing this button initiates the selection of different programming modes of Multi-Digit Toll Control.

- **DENY TOLL REV:** Pressing this button will enable or disable denying on a Toll Reversal within the Control Plan.

- **ABSORB PLAN:** Pressing this button allows the definition or display of an Absorb Plan. If the system is in Toll Control Trunk Group Programming, this button may define an Absorb Plan to be used for the selected Trunk Group.

- **CONTROL PLAN:** If this button is pressed, any one of the 15 Control Plans in the Toll Control may be examined or defined. If the system is in Toll Control Trunk Group Programming, the Control Plan button may be used to assign a Control Plan to each COR of the selected Trunk Group.

- **TRUNK GROUP:** Pressing this button allows the selection of a specific Trunk Group for programming of specific Toll Control parameters.

- **ABSORB UNLOCK:** This button allows the Absorb Unlock digits of an Absorb Plan to be defined.

- **DELETE:** Pressing the DELETE button removes the data entered from the active program. If an extension or trunk is to have toll access, pressing the DELETE button after the TOLL DENY button removes the extension or trunk from the "toll-denied" list, allowing the equipment to have toll access.

- **NEXT:** Entries in a program may be reviewed by selecting the desired program and pressing the NEXT button. Each time the NEXT button is pressed, the next entry in the program selected is displayed.

- **CANCEL:** Pressing the CANCEL button after making a data entry, will remove all new data from temporary storage, and allows the correct information to be entered.

- **CONFIRM:** This button is used in a number of circumstances to confirm a requested action, usually an action which destroys existing programmed information.

- **LAMP TEST:** The LED associated with the LAMP TEST button is flashing when in Extended Programming mode. Pressing the LAMP TEST button, while the switches on the scanner card are set for programming (or dialing the maintenance security code) changes the operational mode of the console; if the console is in the Call Processing mode, it enters the Programming mode.

- **ADD:** This button is used to enable denial on a toll reversal in the Control Plans. It is also used to add entries to a restriction table.

- **ENTER:** Pressing this button transfers the entered data from the system temporary storage to permanent non-volatile memory.

- TABLE: The TABLE button may also be used to define exception tables to Basic Conditions or expansions to Table entries.
- COR NUMBER: This button when pressed allows the selection of a Class of Restriction within Toll Control Trunk Group Programming for a specific Trunk Group.
- BASIC COND: This button when pressed allows the selection of a Basic Condition number within Toll Control Trunk Group Programming.
- DISPLAY ENTRY: This button allows the last numerical parameter entered by the programmer to be displayed (and processed by the machine).
- ABSORB REPEAT: This button allows the Absorb Repeat digits of an Absorb Plan to be defined.

8. ERROR CODES

8.01 This Part lists the error and confirm codes that may be displayed on the console DESTINATION Display during extended programming of the system (see Tables 8-1 and 8-2).

TABLE 8-1
CONFIRM CODES

Error	Applies to	Meaning
C5	Control Plan mode Table mode	An attempt was made to assign a table which is currently assigned elsewhere. Pressing the CONFIRM button will deassign the table from wherever it was previously assigned, to assign it to the specified place.
C6	Table mode	A request has been made to delete all entries in a table. If CONFIRM is pressed, all entries will be deassigned. The old data in the non-volatile RAM will not be destroyed until the ENTER button is pressed, and the table itself can be reprogrammed as desired before the ENTER button is used.

TABLE 8-2
PROGRAMMING ERRORS

Error	Applies to	Meaning
E0	All modes	Invalid button pressed. Consult MAP for correct procedure. System Option 292 may not be enabled.
E1	Trunk Group mode Control Plan mode	Number is not within the range of the parameter being defined. Reenter parameter button defined.
E2	All modes	An attempt was made to leave the current mode after some parameters were changed but before ENTER or CANCEL was pressed. ENTER may be used to write the new programming information back to the non-volatile RAM, or use CANCEL to ignore all programming changes made since the last time ENTER was pressed.
E3	Control Plan mode	The number entered is not valid. Reenter a number which exists.
E4	Table mode	The table entry code is invalid for the table programmed. This occurs in the following situation: 1. A code of more than 3 digits in length for an 800-entry or 20-range table. 2. A code not in the range of 200-999 for an 800-entry table. 3. A code which already exists or a code which would be ambiguous in conjunction with the existing table entries, for a 4-entry table.
E5	Table mode	The table is full and cannot hold the entry.
E7	Config/Init. mode	Config/Init. is not allowed because the Tone Control card switches are not 7776 or the system is not idle.
E9	Config/Init. mode	A hardware failure was detected while clearing the extended customer non-volatile RAM.

TOLL CONTROL

CONTROL PLAN

MITEL

CONTROL PLAN DIAL 1-15	DENY TOLL REV ADD OR DELETE	BASIC COND DIAL 1-5 (NOTE 2)	ADD OR DELETE (NOTE 1)	TABLE DIAL 1-9 (800 ENTRY) 21-32 (20 RANGE) 51-7314 ENTRY) OR DELETE	
1	DELETE	1 (0)	DELETE		
		2 (1-XXX)	DELETE		
		3 (1-X0/1X)	DELETE		
		4 (NXX)	ADD	21	
		5 (N0/1X)	DELETE		
		1 (0)			
		2 (1-XXX)			
		3 (1-X0/1X)			
		4 (NXX)			
		5 (N0/1X)			
		1 (0)			
		2 (1-XXX)			
		3 (1-X0/1X)			
		4 (NXX)			
		5 (N0/1X)			ENTER

NOTE 1

ADD - ALLOW ALL CODES EXCEPT THOSE LISTED IN THE TABLE SPECIFIED

DELETE - DENY ALL CODES EXCEPT THOSE LISTED IN THE TABLE SPECIFIED

NOTE 2: N IS ANY NUMBER 2-9
X IS ANY NUMBER 0-9

TO REVIEW CONTROL PLAN ASSIGNMENTS: CONTROL PLAN (DIAL 1-15) DISPLAY ENTRY NEXT

TO REVIEW THE BASIC CONDITIONS OF THE CONTROL PLAN: CONTROL PLAN (DIAL 1-15) BASIC COND (DISPLAY BASIC CONDITION 1) (DIAL 1) DISPLAY ENTRY (DISPLAY BASIC CONDITION 2) NEXT NEXT (DISPLAY BASIC CONDITION 3)

800 ENTRY EXCEPTION TABLE

FROM BASIC CONDITION 5
OR TABLE NUMBER _____ CONTROL PLAN 1

TOLL CONTROL

THIS TABLE LISTS ALL THE CODES THAT ARE ALLOWED ☑
THIS TABLE LISTS ALL THE CODES THAT ARE DENIED ☐

TABLE DIAL 1-9 DISPLAY ENTRY	PRESS ADD BEFORE DIALING EACH ENTRY			IF AN EXPANSION TABLE IS TO BE APPLIED TO THIS ENTRY TABLE DIAL TABLE NUMBER 1-9 OR 21-33 OR 51-73	
21	212				
	714				
	303				
					ENTER

TO SEARCH FOR A SPECIFIC ENTRY

DISPLAY ENTRY DIAL ENTRY DISPLAY ENTRY IF THE ENTRY DOES NOT EXIST DASHES ARE SHOWN IN THE ENTRY DISPLAY

TO DISPLAY THE NEXT ENTRY IN THE TABLE AFTER THE TABLE HAS BEEN SELECTED

NEXT

TO DELETE THE ENTRY BEING DISPLAYED

DELETE ENTER NOTE: ANY OPERATIONS MAY BE PERFORMED IN ANY ORDER.

TO DELETE ALL ENTRIES FROM A TABLE

TABLE DIAL TABLE NUMBER DELETE CONFIRM ENTER

MITEL

9. MULTI-DIGIT TOLL CONTROL ASSIGNMENT EXAMPLES

General

9.01 This Part contains two examples of Multi-Digit Toll Control. Each example lists the conditions to be fulfilled and shows how to complete the required programming forms.

9.02 These examples also contain a series of figures that represent the pictorial breakdown of the information. These figures should be compared to the programming forms for complete information pertaining to the examples.

9.03 **Example I:** Allow Extension A to ALL local NNX codes and to the three N(0/1)X codes - 212, 714 and 303. Deny access to the CO operator and the complete toll network (Figures 9-1, 9-2).

9.04 **Example 2:** This example will parallel the example outlined in paragraphs 5.10 to 5.16. The Control Plan assignment is again shown in Figure 9-3. Figures 9-4, 9-5 and 9-6 show the Control Plans required, with the completed installation forms following. The required information is:

1. Local CO trunks are split up into two groups, Trunk Groups 1 and 2.

2. Trunk Group #3 consists of tie trunks into another System.

It will be assumed that, for Toll Control purposes, there are three classes of users served by the System:

- User Group A: Upper Management
- User Group B: Sales and Marketing
- User Group C: All other users.

We will also assume the following Allow/Deny conditions are desired for each user group with each Trunk Group:

1. Trunk Groups 1 and 2 (local CO):

User Group A: Allow all calls

User Group B: Allow all calls in home area code (local and toll)
Allow all toll calls to area codes 408, 209, 707
Deny all toll calls to other area codes
Allow toll calls to 613-592-2122
Deny operator access.

User Group C: Allow local calls only (primary calling area)
Deny operator access

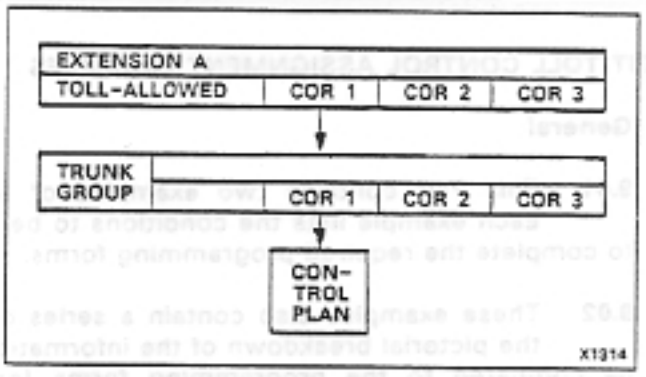


Figure 9-1 Control Plan Assignment

2. Trunk Group 3 (tie):

User Group A: Allow all calls
User Group B: Allow all calls
User Group C: Deny Trunk access on other System (deny "9")
Allow everything else.

Assign Control Plans as shown in Figure 9-3.

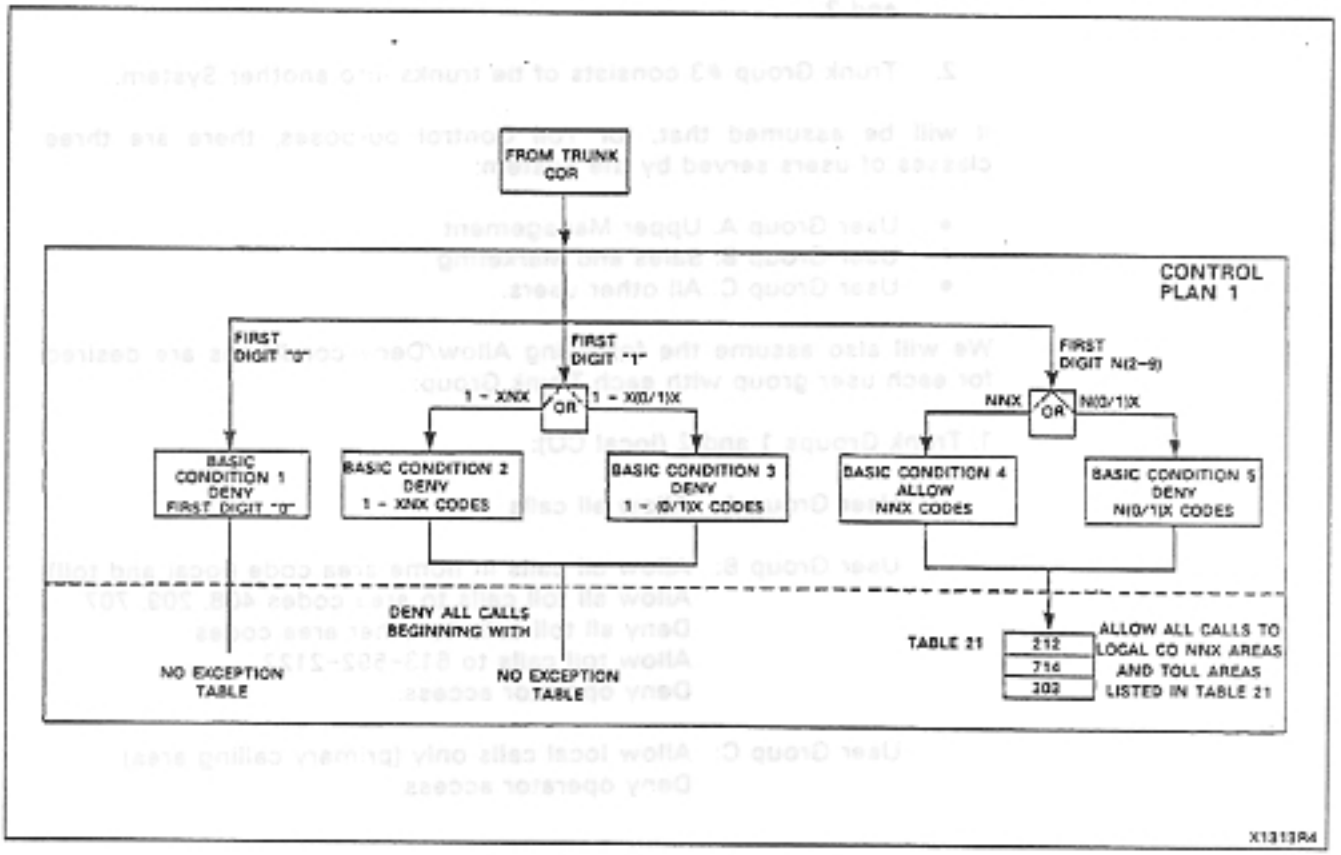


Figure 9-2 Control Plan 1

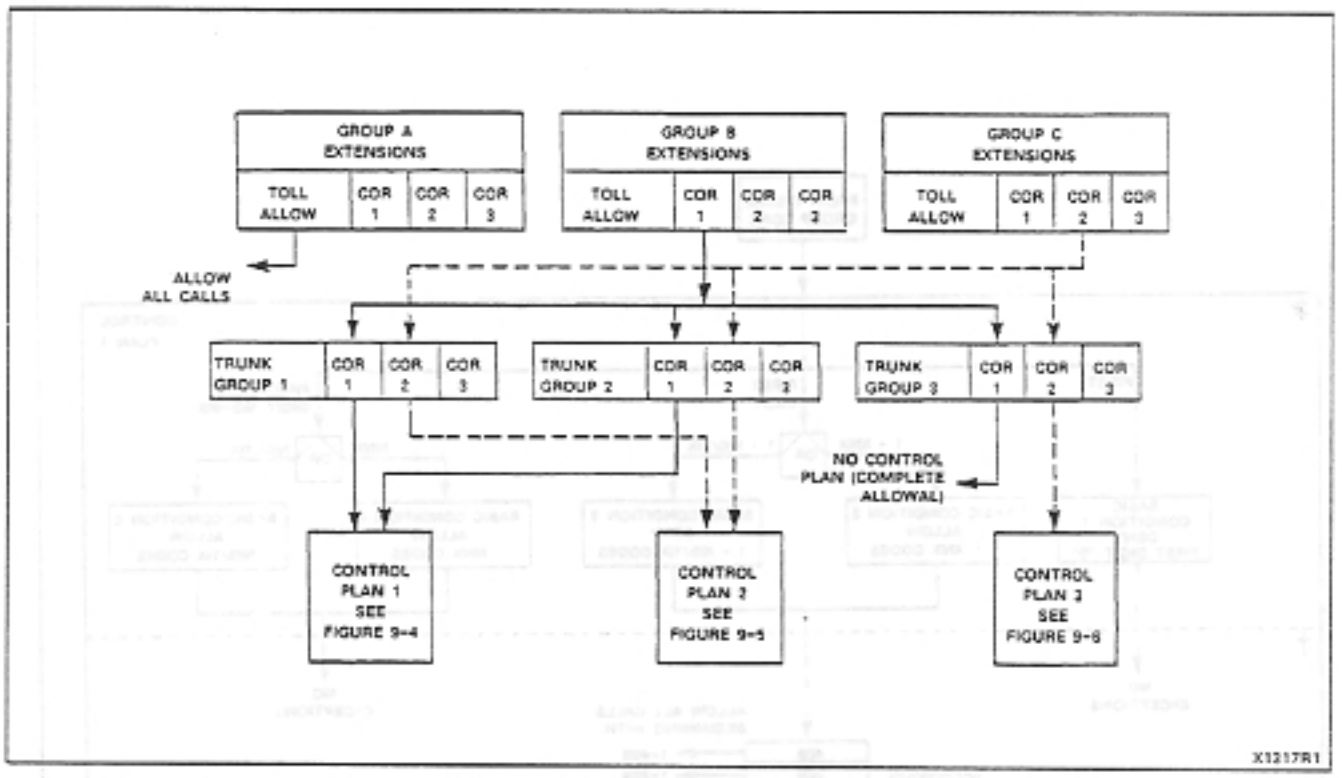


Figure 9-3 Control Plan Assignment

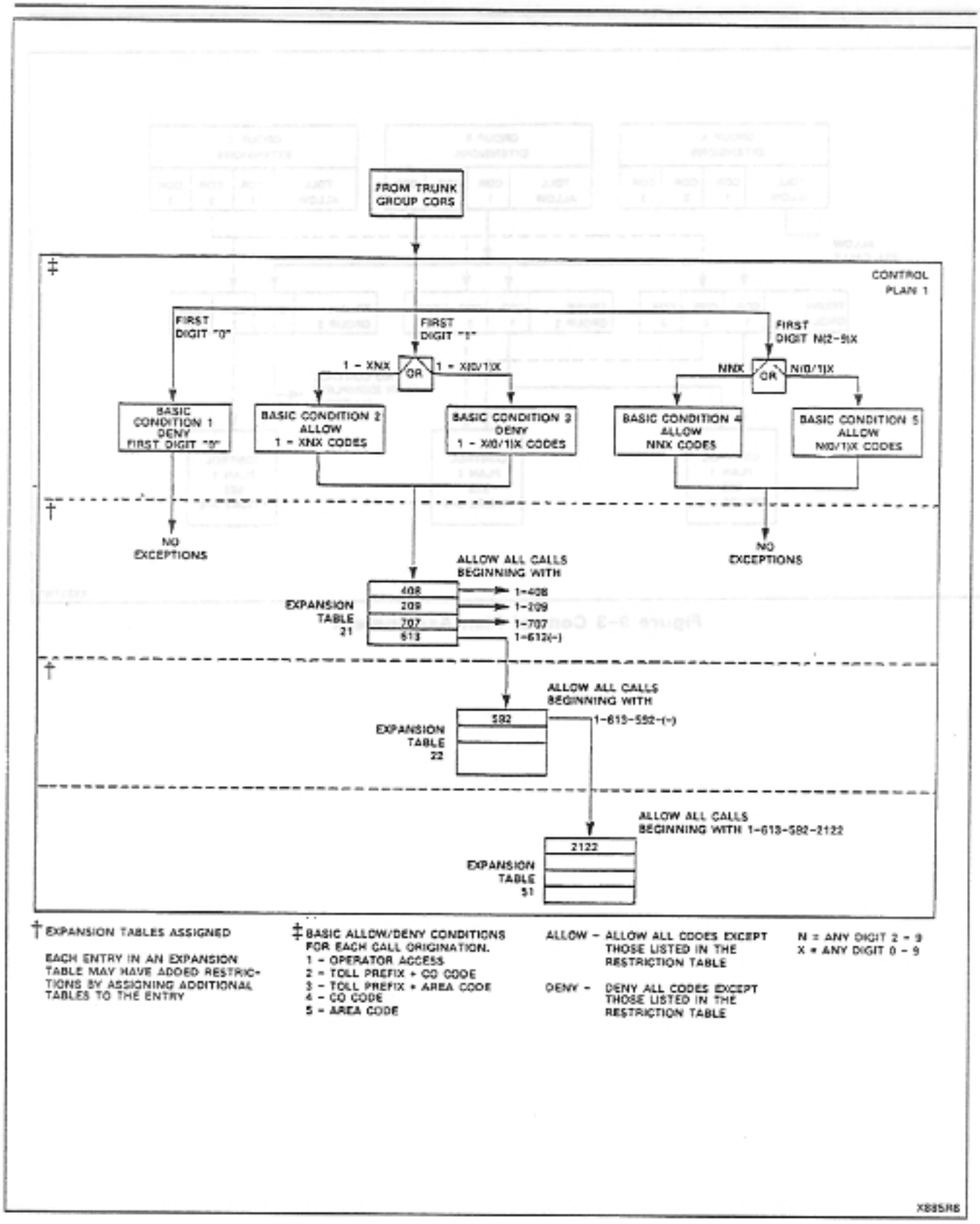


Figure 9-4 Control Plan 1

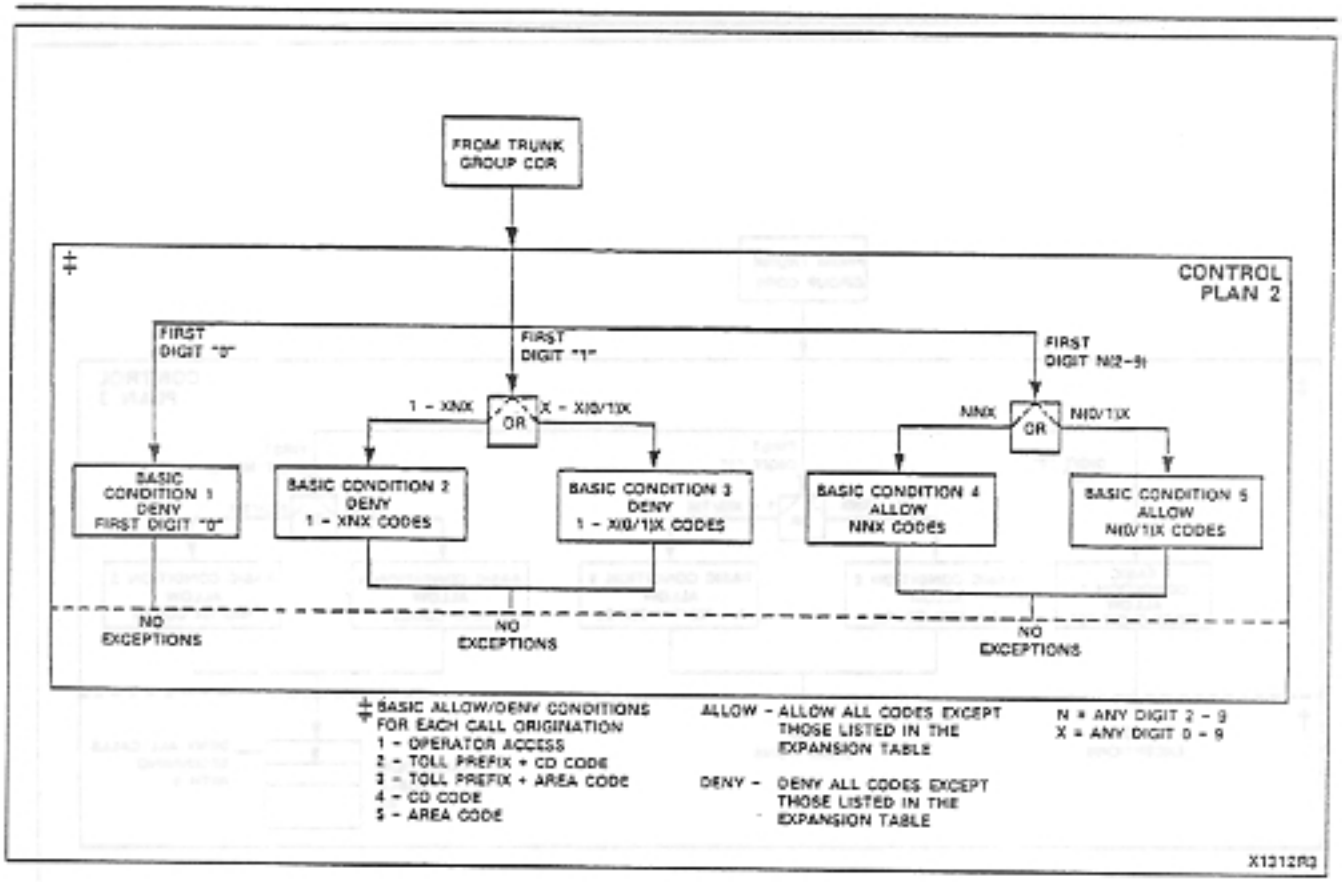
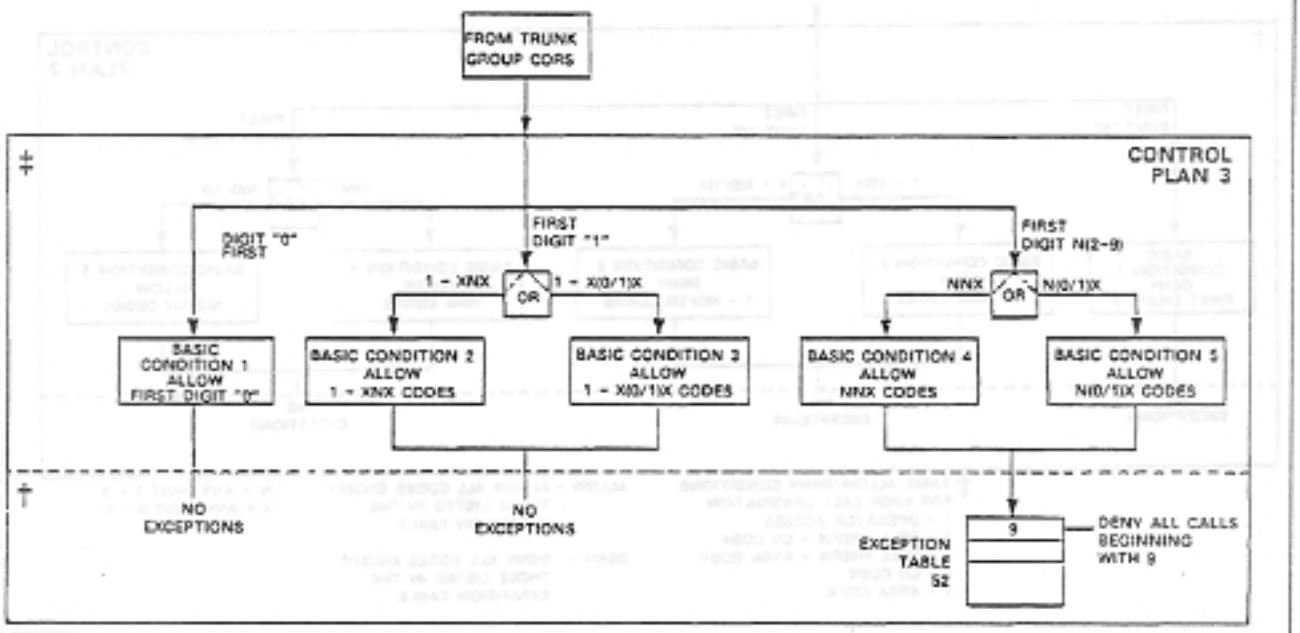


Figure 9-5 Control Plan 2



† EXPANSION TABLES ASSIGNED

EACH ENTRY IN AN EXPANSION TABLE MAY HAVE ADDED RESTRICTIONS BY ASSIGNING ADDITIONAL TABLES TO THE ENTRY

‡ BASIC ALLOW/DENY CONDITIONS FOR EACH CALL ORIGINATION.
1 - OPERATOR ACCESS
2 - TOLL PREFIX + CO CODE
3 - TOLL PREFIX + AREA CODE
4 - CO CODE
5 - AREA CODE

ALLOW - ALLOW ALL CODES EXCEPT THOSE LISTED IN THE EXPANSION TABLE

DENY - DENY ALL CODES EXCEPT THOSE LISTED IN THE EXPANSION TABLE

N = ANY DIGIT 2 - 0
X = ANY DIGIT 0 - 9

Figure 9-6 Control Plan 3

EXTENSION

TO ENTER EXTENSION PROGRAMMING PRESS [EXTN]

NAME	[EQPT NUMBER] DIAL 1-112 OR 181-256 (SEE NOTE 1)	[EXTN NUMBER] DIAL CODE OR SEE NOTES 2,3, OR 4	[COS NUMBER] DIAL 1-10	[TOLL DENY] [ADD] [TOLL DENY] [DELETE] TOLL ALLOW (SEE NOTES 5)	[BUSY LAMP NUMBER] DIAL BUSY LAMP NUMBER 1-200 [DELETE]	[PICKUP GROUP] DIAL 1-30 OR [DELETE]	[ENTER]
	002	202	3	1	002	3	
	003	203	3	1	003	3	
	004	204	4	2	004	1	
	005	205	5	3	005	5	
	006	206	3	1	006	1	

NOTES

1. EQUIPMENT NUMBERS 181-256 APPLIES TO SX-200 ONLY
2. TO ASSIGN NON CONFLICTING SINGLE DIGIT DIRECTORY NUMBER, ENTER N# WHERE N IS THE SINGLE DIGIT
3. TO REMOVE EXTENSION PROGRAMMING

[EXTN] [EQPT NUMBER] DIAL EQUIPMENT NUMBER [EXTN NUMBER] [DELETE]

EXTENSION MUST BE REMOVED FROM ANY HUNT GROUP BEFORE REMOVING THE EXTENSION PROGRAMMING

4. TO SEE THE NEXT EQPT. NUMBER ASSIGNED AS AN EXTENSION [EQPT NUMBER] [NEXT]
5. COR 1-3 APPLIES ONLY IF MULTI DIGIT TOLL CONTROL IS USED

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DIAL-IN TRUNKS

TO ENTER TRUNK PROGRAMMING PRESS [TRUNK]

LOW NUMBER	[EQPT NUMBER] DIAL 10-113 OR 162-268 (SEE NOTES 1,2 AND 3)	SEE NOTE 2 [TYPE] DIAL 2,4,21 OR 41 OR [DELETE]	[COS NUMBER] DIAL 1-16	TOLL DENY [ADD] [TOLL DENY] OR DIAL COR CODE 1,2, OR 3 OR [DELETE] NOTE 6 TOLL ALLOW	[BUSY LAMP NUMBER] DIAL 1-200 OR [DELETE]	[ENTER]
	058	4	15	1	DELETE	
	062	4	15	1	DELETE	

NOTES

1. EQUIPMENT NUMBERS 162-268 APPLIES TO EX-200 ONLY
2. EVEN EQUIPMENT NUMBERS ONLY MAY BE ASSIGNED TO TRUNKS

TYPE 2 = DIRECT INWARD SYSTEM ACCESS VM
TYPE 4 = DIAL IN THE TRUNK SNOW COS VM
TYPE 21 = DIRECT INWARD SYSTEM ACCESS NON VM
TYPE 41 = DIAL IN THE TRUNK SNOW COS NON VM

4. TO REMOVE A TRUNK ASSIGNMENT
NOTE TRUNK MUST FIRST BE REMOVED FROM TRUNK GROUP

[EQPT NUMBER] DIAL EQUIPMENT NUMBERS [TYPE] [DELETE]

5. TO SEE THE NEXT EQUIPMENT NUMBER ASSIGNED AS A TRUNK

[EQPT NUMBER] [NEXT]

6. COR 1-3 APPLIES ONLY IF SMITH DIGIT TOLL CONTROL IS USED
7. SLOT 1 SHOULD CONTAIN A LINE CARD SO FIRST
TRUNK EQUIPMENT NUMBER SHOULD BE 010

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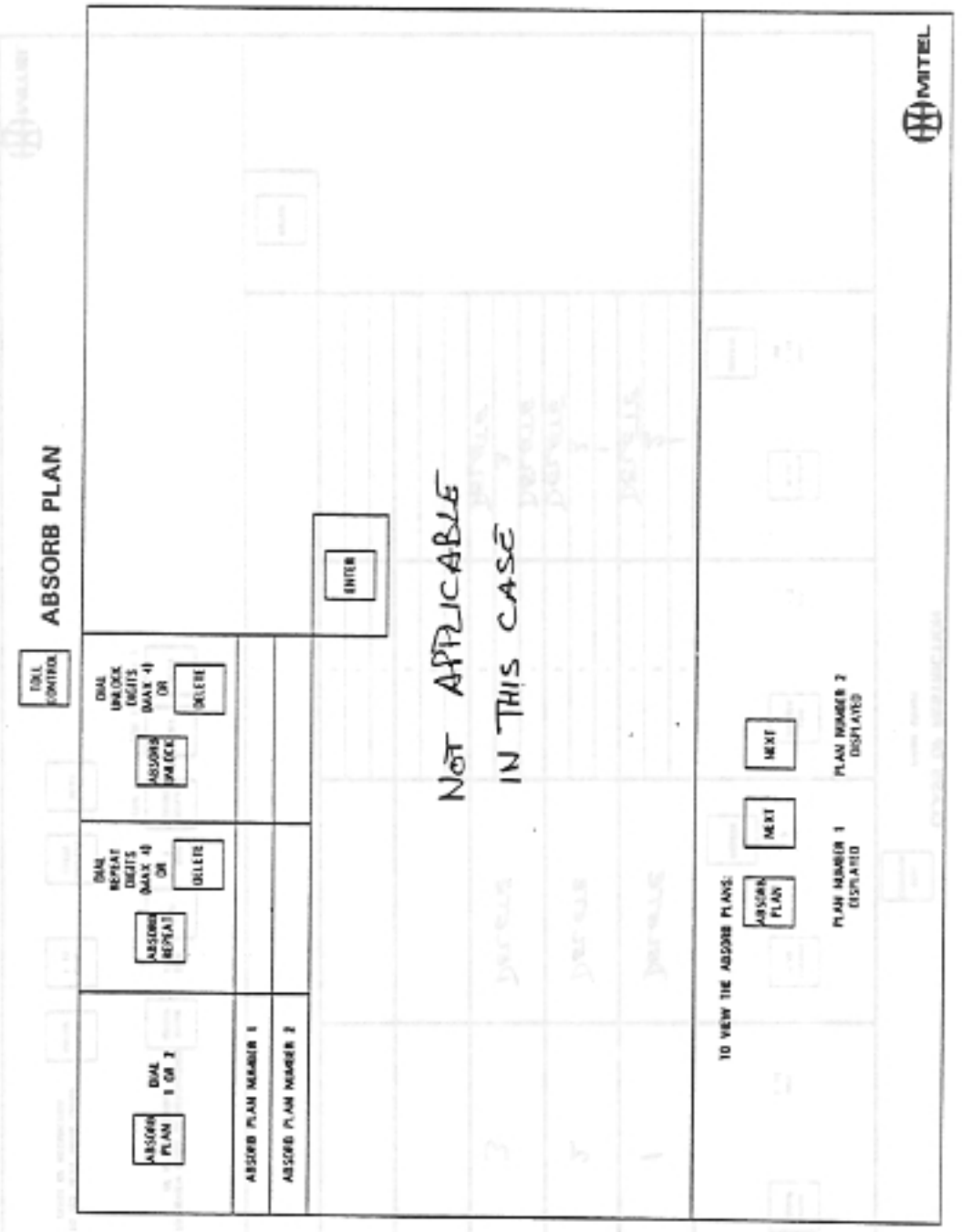
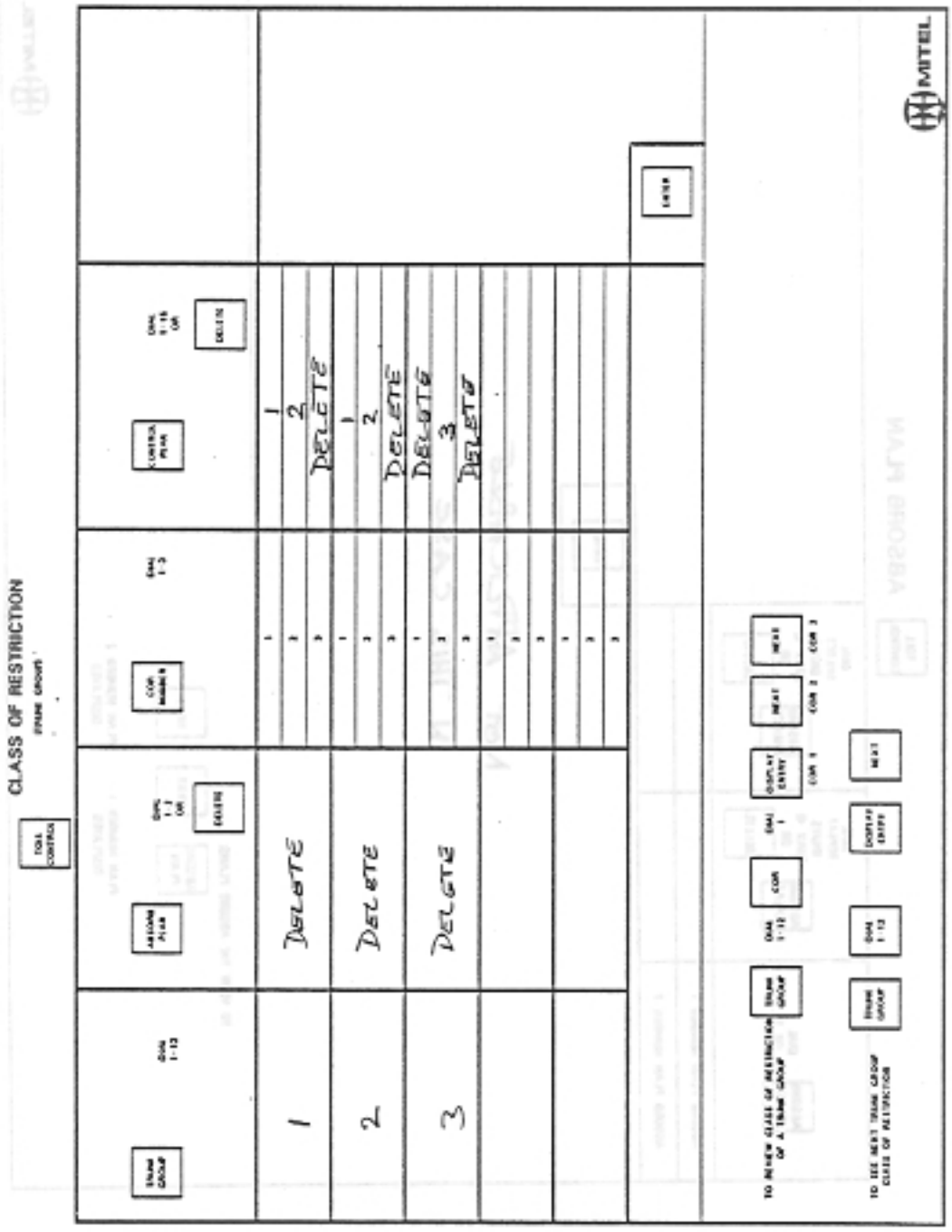

ABSORB PLAN
DIAL CONTROL
ABSORB PLAN
DIAL 1 OR 2
ABSORB REPEAT
DIAL REPEAT DIGITS (MAX 4) OR
DELETE
ABSORB UNLOCK
DIAL UNLOCK DIGITS (MAX 4) OR
DELETE
ABSORB PLAN NUMBER 1
ABSORB PLAN NUMBER 2
ENTER
NOT APPLICABLE
IN THIS CASE
TO VIEW THE ABSORB PLANS:
ABSORB PLAN
NEXT
PLAN NUMBER 1 DISPLAYED
NEXT
PLAN NUMBER 2 DISPLAYED
MITEL


CLASS OF RESTRICTION
TRUNK GROUP
1
2
3
DELETE
DELETE
DELETE
DELETE
DELETE
DELETE
DELETE
DELETE
DELETE
MITEL

TOLL CONTROL

CONTROL PLAN

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CONTROL PLAN DIAL 1-15	DENY TOLL REV — ADD OR DELETE	BASIC COND DIAL 1-5 (NOTE 2)	ADD OR DELETE (NOTE 1)	TABLE — DIAL 1-5 (800 ENTRY) 21-33 (20 RANGE) 51-7204 ENTRY OR DELETE	
1	DELETE	1 (0)	DELETE		
		2 (1-XXX)	ADD		
		3 (1-XX/1X)	DELETE		
		4 (NXX)	ADD	21	
		5 (NX/1X)	ADD		
2	DELETE	1 (0)	DELETE		
		2 (1-XXX)	DELETE		
		3 (1-XX/1X)	DELETE		
		4 (NXX)	ADD		
		5 (NX/1X)	DELETE		
3	DELETE	1 (0)	ADD		
		2 (1-XXX)	ADD		
		3 (1-XX/1X)	ADD		
		4 (NXX)	ADD	52	ENTER
		5 (NX/1X)	ADD		

NOTE 1

ADD - ALLOW ALL CODES EXCEPT THOSE LISTED IN THE TABLE SPECIFIED

DELETE - DENY ALL CODES EXCEPT THOSE LISTED IN THE TABLE SPECIFIED

NOTE 2 X IS ANY NUMBER 2-9
X IS ANY NUMBER 0-9

TO REVIEW CONTROL PLAN ASSIGNMENTS: CONTROL PLAN — DIAL 1-15 — DISPLAY ENTRY — NEXT

TO REVIEW THE BASIC CONDITIONS OF THE CONTROL PLAN: CONTROL PLAN — DIAL 1-15 — BASIC COND (DISPLAY BASIC CONDITION 1) — DIAL 1 — DISPLAY ENTRY (DISPLAY BASIC CONDITION 2) — NEXT — NEXT (DISPLAY BASIC CONDITION 3)

20 RANGE EXCEPTION TABLE

FROM BASIC CONDITION 5

OR TABLE NUMBER _____ CONTROL PLAN 1

FULL CONTROL

THIS TABLE LISTS ALL THE CODES THAT ARE ALLOWED ☒

THIS TABLE LISTS ALL THE CODES THAT ARE DENIED ☐

TABLE DIAL 21-30 DISPLAY ENTRY	PRESS ADD BEFORE DIALING EACH ENTRY			IF AN EXPANSION TABLE IS TO BE APPLIED TO THIS ENTRY TABLE DIAL TABLE NUMBER 1-72	
21	408				
	207				
	707				
	613			22	
					ENTER

TO SEARCH FOR A SPECIFIC ENTRY

DISPLAY ENTRY DIAL ENTRY DISPLAY ENTRY — IF THE ENTRY DOES NOT EXIST DASHES ARE SHOWN IN THE ENTRY DISPLAY

TO DISPLAY THE NEXT ENTRY IN THE TABLE AFTER THE TABLE HAS BEEN SELECTED

NEXT

TO DELETE THE ENTRY BEING DISPLAYED

DELETE ENTER — NOTE: ANY OPERATIONS MAY BE PERFORMED IN ANY ORDER.

TO DELETE ALL ENTRIES FROM A TABLE

TABLE DIAL TABLE NUMBER DELETE CONFIRM ENTER

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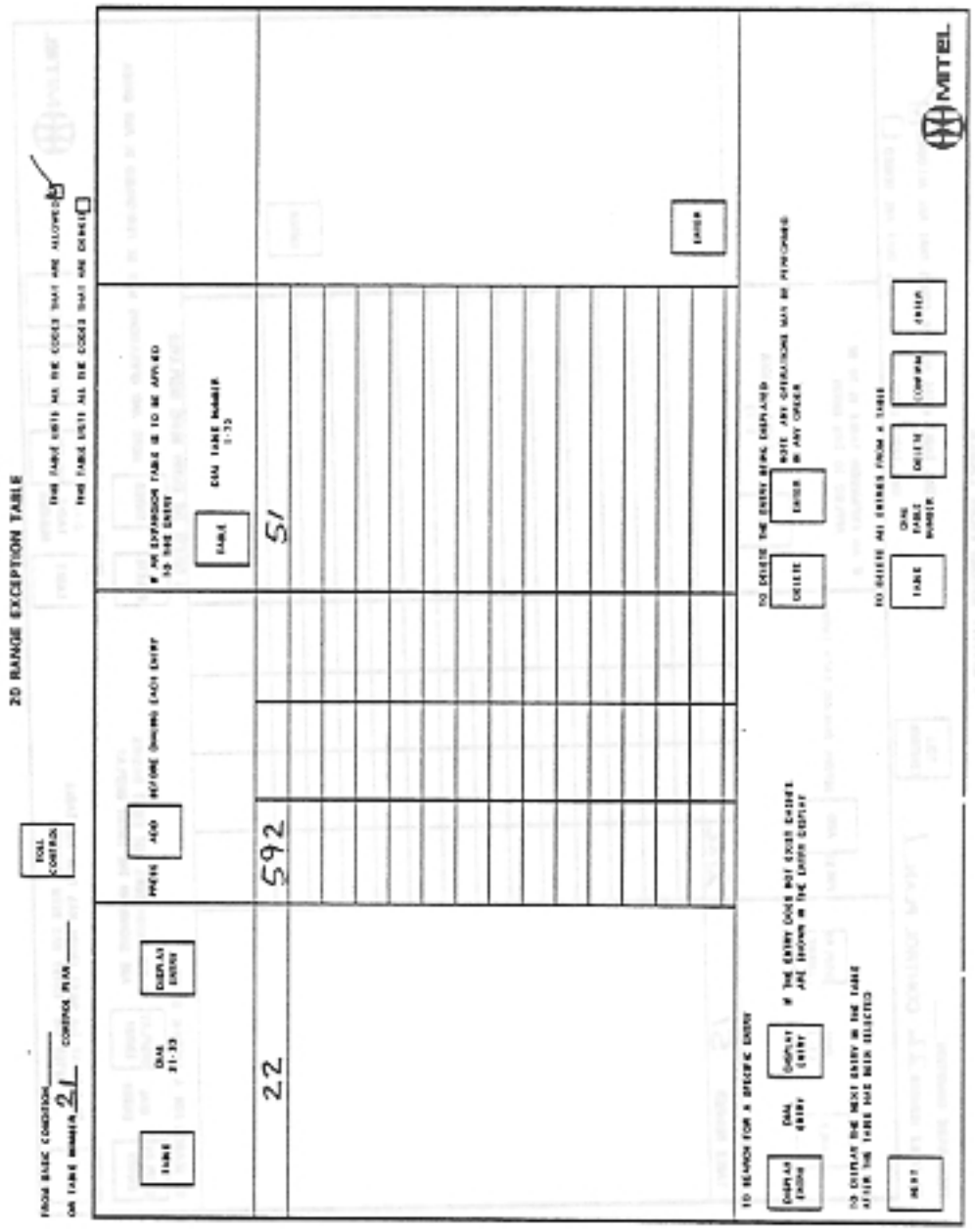
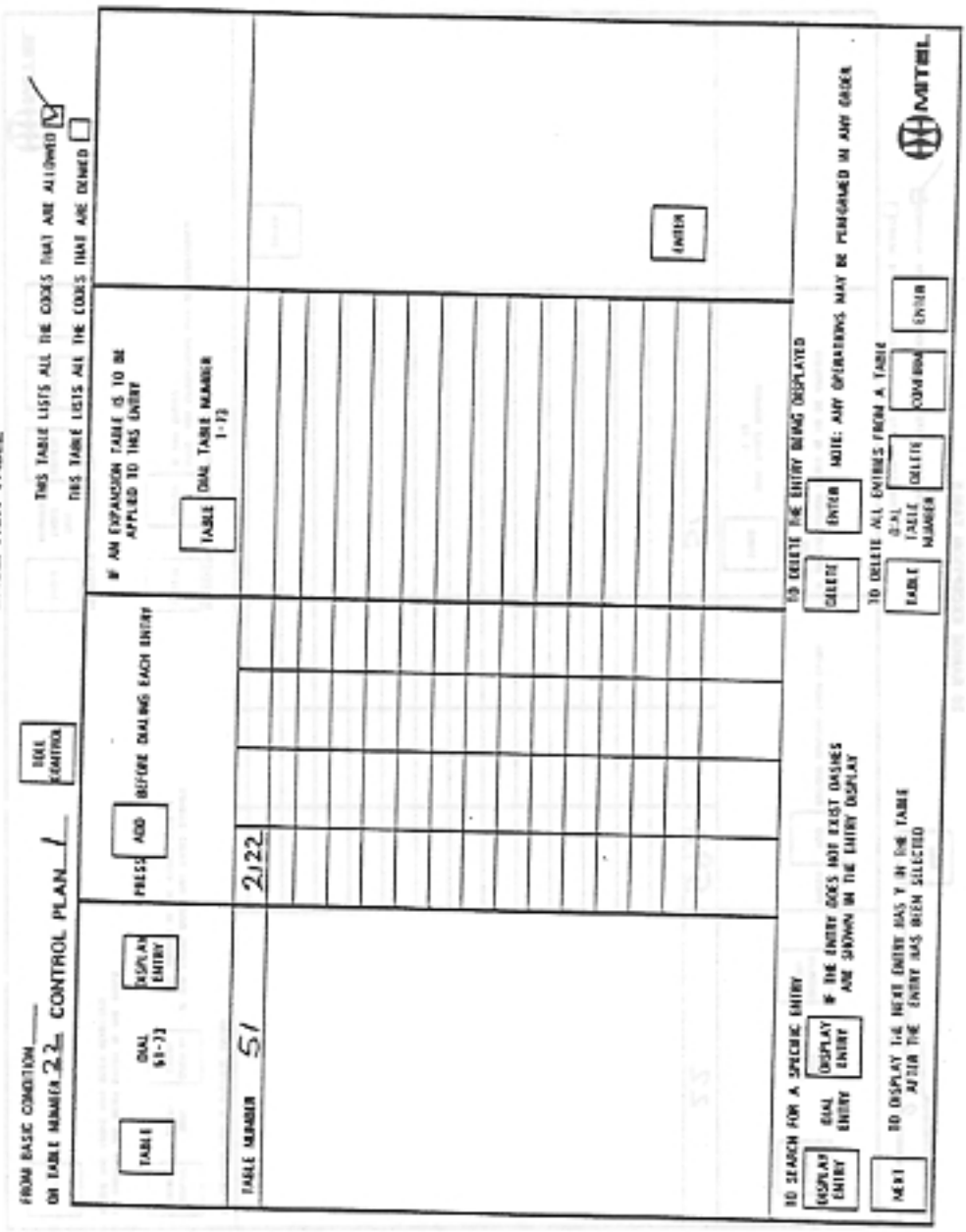

20 RANGE EXCEPTION TABLE
FROM BASIC CONDITION
ON TABLE NUMBER 21
CONTROL PLAN
TOLL CONTROL
TABLE
DIAL 21-23
DISPLAY ENTRY
PRESS
ADD
BEFORE DIALING EACH ENTRY
AN EXPANSION TABLE IS TO BE APPLIED TO THIS ENTRY
TABLE
DIAL TABLE NUMBER 1-23
22
592
51
ENTER
TO SEARCH FOR A SPECIFIC ENTRY
DISPLAY ENTRY
DIAL ENTRY
DISPLAY ENTRY
THE ENTRY DOES NOT EXIST CHOICE ARE SHOWN IN THE ENTRY DISPLAY
TO DELETE THE ENTRY BEING DISPLAYED
DELETE
ENTER
NOTE ANY OPERATIONS MAY BE PERFORMED IN ANY ORDER
TO DISPLAY THE NEXT ENTRY IN THE TABLE AFTER THE TABLE HAS BEEN SELECTED
NEXT
TO DELETE ALL ENTRIES FROM A TABLE
TABLE
DIAL TABLE NUMBER
DELETE
CONFIRM
ENTER
MITEL


4 ENTRY EXCEPTION TABLE
FROM BASIC CONDITION
ON TABLE NUMBER 22 CONTROL PLAN 1
TOLL CONTROL
THIS TABLE LISTS ALL THE CODES THAT ARE ALLOWED
THIS TABLE LISTS ALL THE CODES THAT ARE DENIED
TABLE
DIAL 51-73
DISPLAY ENTRY
PRESS
ADD
BEFORE DIALING EACH ENTRY
IF AN EXPANSION TABLE IS TO BE APPLIED TO THIS ENTRY
TABLE
DIAL TABLE NUMBER 1-73
TABLE NUMBER 51
2122
ENTER
TO SEARCH FOR A SPECIFIC ENTRY
DISPLAY ENTRY
DIAL ENTRY
DISPLAY ENTRY
IF THE ENTRY DOES NOT EXIST DASHES ARE SHOWN IN THE ENTRY DISPLAY
NEXT
TO DISPLAY THE NEXT ENTRY HAS Y IN THE TABLE AFTER THE ENTRY HAS BEEN SELECTED
TO DELETE THE ENTRY BEING DISPLAYED
DELETE
ENTER
NOTE: ANY OPERATIONS MAY BE PERFORMED IN ANY ORDER
TO DELETE ALL ENTRIES FROM A TABLE
TABLE
DIAL TABLE NUMBER
DELETE
CONFIRM
ENTER
MITEL

4 ENTRY EXCEPTION TABLE

FROM BASIC CONDITION ____

OR TABLE NUMBER ____ CONTROL PLAN 3 [TOLL CONTROL]

THIS TABLE LISTS ALL THE CODES THAT ARE ALLOWED ☐

THIS TABLE LISTS ALL THE CODES THAT ARE DENIED ☑

[TABLE] DIAL 51-73 [DISPLAY ENTRY]

PRESS [ADD] BEFORE DIALING EACH ENTRY

IF AN EXPANSION TABLE IS TO BE APPLIED TO THIS ENTRY [TABLE] DIAL TABLE NUMBER 1-73

TABLE NUMBER 52

9				

[ENTER]

TO SEARCH FOR A SPECIFIC ENTRY

[DISPLAY ENTRY] DIAL ENTRY [DISPLAY ENTRY] IF THE ENTRY DOES NOT EXIST DASHES ARE SHOWN IN THE ENTRY DISPLAY

[NEXT] TO DISPLAY THE NEXT ENTRY HAS Y IN THE TABLE AFTER THE ENTRY HAS BEEN SELECTED

TO DELETE THE ENTRY BEING DISPLAYED

[DELETE] [ENTER] NOTE: ANY OPERATIONS MAY BE PERFORMED IN ANY ORDER.

TO DELETE ALL ENTRIES FROM A TABLE

[TABLE] DIAL TABLE NUMBER [DELETE] [CONFIRM] [ENTER]

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SX-100® AND SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION SYSTEM
AUTOMATIC ROUTE SELECTION DESCRIPTION
GENERIC ACD

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1. GENERAL

Introduction

1.01 This Section gives a general description of the Automatic Route Selection (ARS) feature, which is applicable to SX-100 and SX-200 Automatic Call Distribution Systems when fitted with the Generic ACD software package. General descriptions of the SX-100 and SX-200 Systems are contained in Section MITL9105/9110-090-100-NA. The foregoing Section also contains a listing of applicable documents for these systems.

Reason for Issue

1.02 This Section has been issued to provide Generic ACD information.

Brief Description

1.03 When properly programmed, ARS causes the system to select the lowest cost trunk available during selected times in a 24-hour period, for extension- or console-initiated calls. A user simply dials the ARS code followed by the required digits. The feature will select the optimum routes available for the time period and will insert or delete appropriate routing digits. A 24-hour period may be split into a maximum of three periods or schedules. Two of these periods are programmable. The third period is automatically the remainder of time left after the first two periods are programmed. These time periods allow the ARS feature to take advantage of rate structures that may vary during a 24-hour period.

1.04 The ARS feature is compatible with other features in the system, such as Speed Call (Section MITL9105/9110-090-220-NA), Traffic Measurement (Section MITL9105/9110-090-450-NA), Multi-Digit Toll Control (Section MITL9105/9110-090-212-NA), Station Message Detail Recording (Section MITL9105/9110-090-451-NA) and Automatic Call Description (Section MITL9105/9110-090-222-NA).

2. NUMBERING PLAN (NORTH AMERICAN)

2.01 Almost every subscriber in the North American telephone system may access any other subscriber by dialing a maximum of 10 or 11 digits. These digits consist of an optional toll prefix number (usually 1), a 3-digit area code, a 3-digit Central Office code and a 4-digit subscriber number (see Figure 2-1 and para 5.12).

2.02 In the area code the first digit may be any number except one or zero. The second digit must be one or zero. The last digit may be any number zero through nine.

2.03 In the CO code the first digit may be any number two through nine. The second digit must not be either digit zero or one, and the last digit may be any digit zero through nine. It should be noted

that there are assigned service codes such as 911 or 411 that may conflict.

2.04 The subscriber number may be any series of digits from 0000 to 9999. Once again there are assigned numbers such as 1212 and 1000 that are generally reserved for special services.

Interchangeable Codes

2.05 The requirement for the total number of office codes within an area may require the use of office codes other than the NNX format outlined in 2.02 (i.e., the employment of codes in NXX format). Conversely the need for area codes eventually may be such as to exhaust the available area code universe (N0/1X) which then also expands to an NXX format. In either event the office and area codes are known as Interchangeable Codes.

2.06 When Interchangeable Office codes are used, the prefix digit "1" has to be used to identify a long-distance call. This requirement is met by setting a system option (System Option 242). The Home (Local) Area code requires it to be identified when programming the system.

Area Code	Office Code	Subscriber Number
N0/1X	NNX	XXXX

where X = any number from 0 through 9
N = any number from 2 through 9
0/1 = either the number 0 or 1

Figure 2-1 North American Numbering Plan

2.07 Time, as previously mentioned, is a major factor in trunk usage. Certain trunks will be cheaper if used at certain times of the day. For example, consulting Figure 2-2, it is seen that regular telephone service from 08:00 to 17:00 provides no discount. At this time it would be desirable to use a WATS (Wide Area Toll Service) line to achieve a lower cost. After 17:00 it may be more economical to use a regular line.

08:00-17:00	No Discount
17:00-23:00	1/3 off
23:00-08:00	2/3 off

Figure 2-2 Time Periods

3. ROUTING

3.01 The ARS feature is based upon the North American telephone numbering system. Using the information reviewed in Part 2 of this Section, one must consider trunking arrangements in the system. Obviously there must be a proper ratio of trunks to extensions. This may be calculated by completing a traffic survey as per Section MITL9105/9110-090-450-NA or MITL9105/9110-090-451-NA.

3.02 These studies reveal trunk requirements within a system. Trunks may be Foreign Exchange (FX), Wide Area Toll Service (WATS), Standard CO trunks, Tie trunks, etc. The type and/or quantity of each is determined during the traffic study. For example, in the case of a customer who makes most of his calls to a specific distant area, a number of FX trunks to that location's Central Office (CO) may be the best and most economical method. The customer may wish to force extension users to use FX trunks by Toll Control. This would work, but under heavy traffic conditions many extensions would not be able to complete calls due to busy FX trunks. It would be more economical and efficient to steer the extension user to the most economical route (i.e., WATS) available. The best method of routing (or steering) would be one that did not require any special dialing (beyond an access code) by an extension user. That is, the extension user would only dial the ARS access code + the normal 7 or 10 digits (the prefix may be optional). The system would analyse the dialed digits and select a route based upon the time of the day. The system would be programmed to insert and delete digits as required by the route selected. The dialed number would be first stored, examined and a route selected, then outpulsed rapidly (in a manner similar to speed call. Also, during out-pulsing, the user could be connected to Music on Hold if provided). The user would still retain full use of such features as Speed Call and Multi-Digit Toll Control. In addition, if a trunk-busy (tone) condition is encountered, the user may dial the Automatic Callback Busy code. The user would be called back when the first trunk in the ARS routing is free. There are a maximum of 32 callbacks that may be stored in the system. Upon answering the call, the user will be connected to the trunk and the system will automatically outpulse the digits (and prefix if required) dialed.

4. OPERATION

4.01 The primary goal in the operation of ARS is to provide the most economical trunk to a user at a given hour of the day. At the same time the ARS feature must retain a degree of simplicity that requires the user to dial only the ARS feature code, then normal digits (Figure 4-1).

4.02 As described in Part 2 of this Section, there may be 7 or 10 digits dialed with a "1" prefix. In the case of Interchangeable Office codes, the system may be alerted to the NXX difficulty by selecting System Option 242 (ARS Unrestricted Office Locale Enable). This option will alert the system to look for a "1" after the ARS access code, for all long-distance calls outside of the Home Area code. In this case an extension that does not dial "1" after the ARS code will receive

reorder tone or may be directed to Supervisor. If System Option 242 is not enabled, upon dialing ARS feature code the CPU will consult its RAM memory as to the remaining digits dialed. The CPU will expect the remaining digits dialed to conform to the North American Numbering Plan.

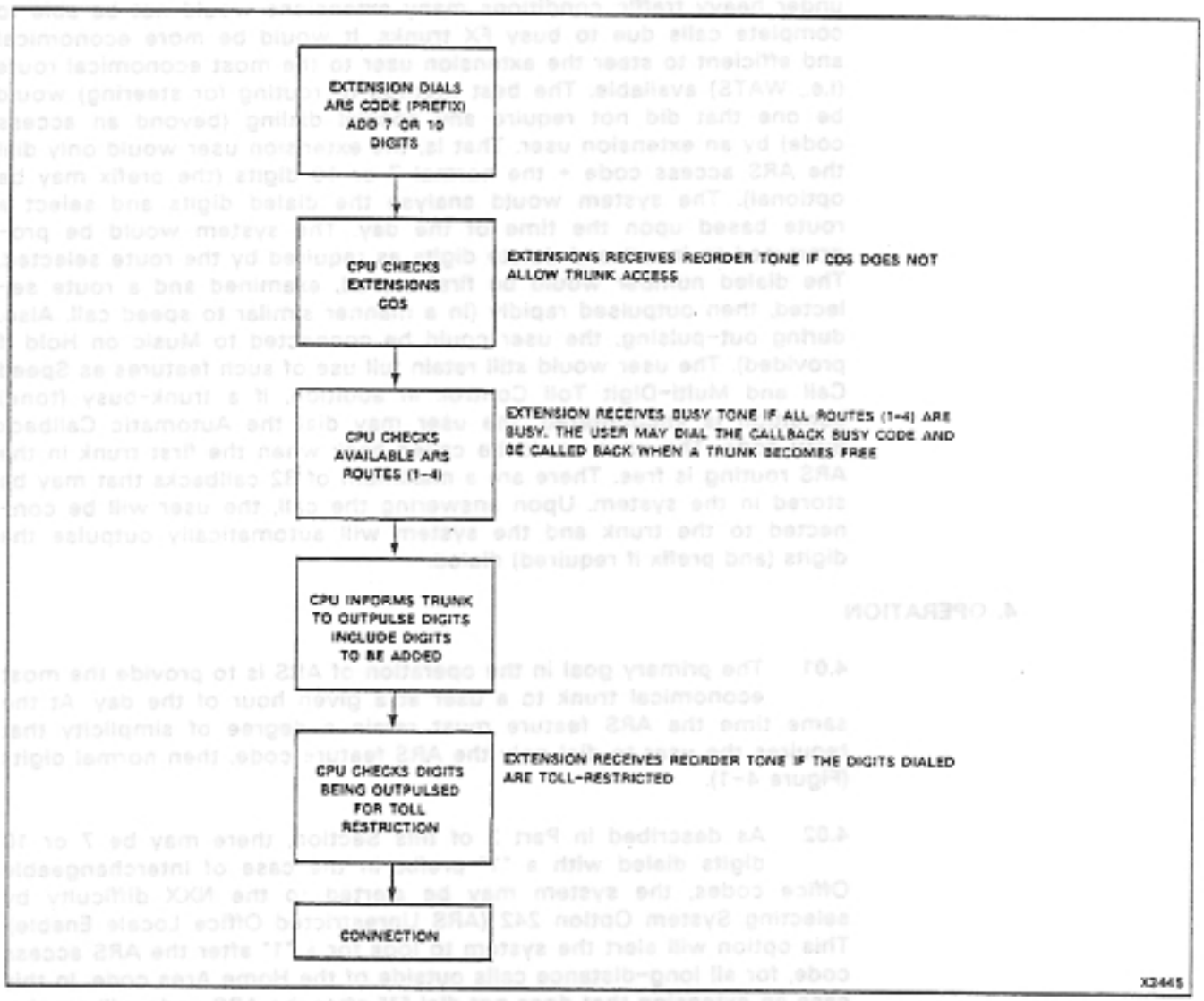


Figure 4-1 ARS Operation

TABLE 5-1
800/9-ENTRY TABLES

NUMBER OF 800-ENTRY TABLES	NUMBER OF 9-ENTRY TABLES	TABLE RANGE
0	110	1-110
1	105	2-106
2	100	3-102
3	95	4-98
4	90	5-94
5	85	6-90
6	80	7-86
7	75	8-82
8	70	9-78
9	65	10-74
10	60	11-70
11	55	12-66
12	50	13-62
13	45	14-58
14	40	15-54
15	35	16-50
16	30	17-46
17	25	18-42
18	20	19-38
19	15	20-34
20	10	21-30
21	5	22-26
22	0	-

5. TABLES

5.01 This Part is a brief description of all Tables used in the ARS feature. Part 6 of this Section will detail how these tables relate to each other.

Entry Tables

5.02 There are two types of tables available in the ARS feature: 800-Entry Tables and 9-Entry Tables. The quantity and type of these Tables are determined by the number of 800-Entry Tables selected (Table 5-1). An 800- or a 9-Entry Table will store CO codes as per the North American Numbering Plan. An 800-Table Entry can have a maximum of 800 CO code entries of 200-999. The 800-Entry Table is the definitive table. That is, the number of 800-Entry Tables selected will affect the number of 9-Entry Tables. When in Extended Programming an 800-Entry Table will be indicated by a period after the Table number.

5.03 A 9-Entry Table may have a maximum of nine CO codes in each Table Entry. The advantage of 9-Entry Tables over 800-Entry Tables is in the increased flexibility of 9-Entry Tables. This flexibility is

due to the distribution of 800-Entry Tables to 9-Entry Tables (Table 5-1). An analysis of the ARS requirements will reveal a ratio of 800-Entry Tables to 9-Entry Tables and this ratio must be selected during Extended Programming by entering the number of 800-Entry Tables.

Area Code Tables

5.04 Once a ratio of 800-Entry Tables/9-Entry Tables has been established, Area Code Tables must be defined. The Area Code Table selects a specific Route Table (0-15) to be followed when an area code is dialed. All area codes are originally assigned to Route Table 15. By selecting an area code and assigning it to an Area Code Table (which will specify a Route Table to be followed), that area code will be removed from Route Table 15.

Area/Office Code Tables

5.05 An Area/Office Code Table allows a degree of flexibility in the Area Code Table. This Table depends not only on the area code being defined but the CO code must also be defined. The Area/Office code information is entered in a Code Table. The number of Code Tables is dependent upon the Configuration of the Generic. Each Code Table is an 800- or 9-Entry Table as defined in Table 5-1. As in the Area/Office Code Table, the Code Table may be assigned to one of fifteen Route Tables. The Area/Office Code Table allows exceptions to the Area Code Table. When an area code is dialed, followed by an Office Code, the system consults the Code Tables. If an Area/Office code combination is found, the Area Code Table is not followed. In this case the Area/Office Code Table is followed. This concept will be further explained in an example in Part 6 of this Section.

Modify Digits Tables

5.06 In some tandem or network situations it is desirable to have digits deleted or added. This allows the ARS user to dial the ARS code and 7 or 10 digits through a tandem switch. However, if System Option 242 is set, the digit 1 prefix must be dialed. The system will automatically add or delete all digits required to access tandem trunks. The Modify Digits Table allows 1-10 digits (maximum) to be deleted. A maximum of 20 digits may be added. Each 5 second pause (*1), wait for dial tone (*2), and 10 second pause (*5) counts as one digit in the digit add mode. A modify Digit Table may be assigned to any trunk in the Route Tables. If an *4 is assigned before the digits add are entered, the digits occurring after the *4 and before the next * will not be printed in the SMDR reports or appear on the SUPERSET 4 ™ display.

Routing Tables

5.07 The Routing Table does the actual routing of external calls. The routing is based primarily upon the time of day and Trunk Group availability. The time of day may be subject to three time periods (Schedules A, B and C) during a 24-hour day. A maximum of

four Trunk Groups may be assigned a preference of 1 to 4 per time period (schedule). The same Trunk Groups may be assigned different preferences in different time periods (Schedules).

5.08 For example, consider three Trunk Groups:

- Trunk Group 1 is composed of Tie trunks
- Trunk Group 2 is composed of WATS trunks
- Trunk Group 3 is composed of DDD (Direct Distance Dialing) Trunks

In Scheduled A (08:00-17:00), Trunk Group 1 is preference 1, Trunk Group 2 is preference 2 and Trunk Group 3 is not assigned a preference. In Schedule B (17:00-23:00), Trunk Group 1 retains preference 1, Trunk Group 3 is assigned preference 2 and Trunk Group 2 is assigned preference 3. In Schedule C (the remaining time), Trunk Group 1 is preference 1, Trunk Group 3 is assigned preference 2 and Trunk Group 2 is not assigned. Note that a fourth preference was not used in this example.

Schedules A, B and C

5.09 There are three time Schedules (A, B and C) based upon a 24-hour day. Schedule A will originally appear as assigned to the entire 24-hour period. Schedule A may be programmed to any time period in the 24-hour day. Schedule B may not be programmed if desired. Any time period not programmed to Schedule A or B will default to Schedule C. Schedules A, B, and C must start and stop on the hour; minutes may not be programmed. These Schedules (A, B and C) allow Basic Schedule Data to be subject to a maximum of three time periods, in which each time period may change the order of preference in the Basic Schedule Data. In other words, route choice preference may change in order of time Schedule A, B, and C. Schedules A, B and C are entered as beginning hours and ending hours. For example, if the beginning hour is 08:00 and the ending hour is 17:00, the entry must be made as 0817. For a brief overview of paragraphs 5.04-5.09 consult Figure 5-1.

Service Codes with ARS

5.10 Any 3-digit code which appears in the Area Code Table may be programmed as a service code by assigning it Route Table 0. Thus codes such as 411, 611 and 911 may be labelled as service codes.

5.11 The Route Table used for the service call is chosen in exactly the same way as with any other local call. This is done by using 411 as an office code in programming an Office Code Table. Hence, if the local area code is 613, programming 411 as an office code in a table tied to 613 causes the system to use the associated route table specified (Figure 5-2). Upon a user dialing 411, the system finds that 411 is a service code and uses 613 as the area code to search for a Route Table to use (Figure 5-3).

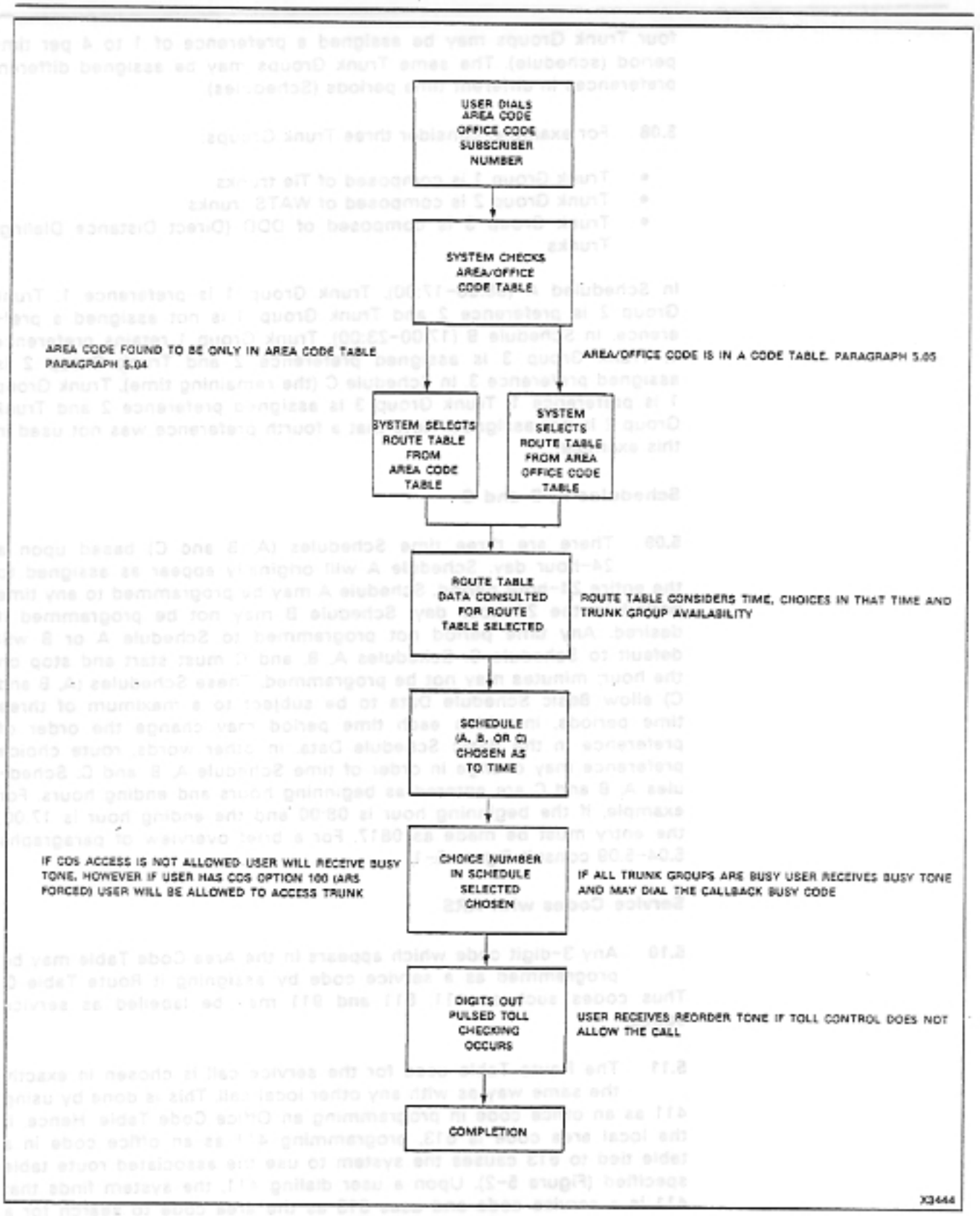


Figure 5-1 ARS Overview

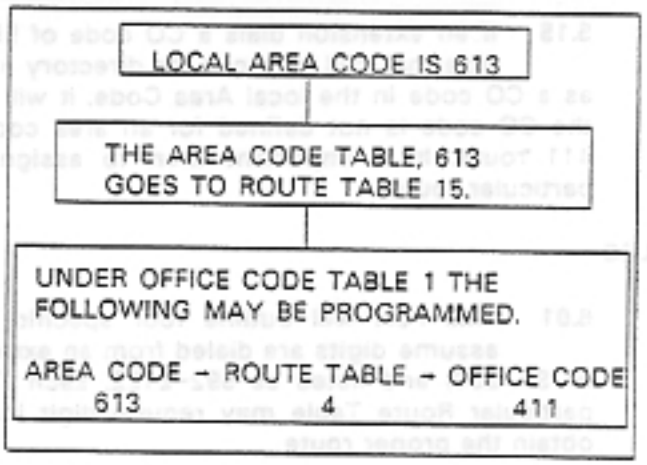


Figure 5-2 Service Codes

5.12 The programmer has full flexibility in how to program the service codes routes, as with any other local call. The same technique is used with the unrestricted office code option programmed.

Dial "0" Calls

5.13 In some locales it is possible to dial overseas long-distance directly. This is done by dialing 0, the country code and the required directory digits. After receiving a digit 0, a CO in these locales waits a period of time before acting on it. If no other digits occur before the time is up, the CO assumes that the call is for operator assistance. If there are digits, the call is recognized as a long-distance call.

5.14 If Dial "0" calls are to be used with ARS, the same route as that programmed for 411 calls is used. Therefore a route for 411 calls must be programmed. Like a CO, the system will wait a period of time (5 or 10 seconds) before acting on any dialed digits. If, before the time is up, the system receives additional digits, the call will be subject to ARS. If no other digits are received, the call will be treated as a call for operator assistance.

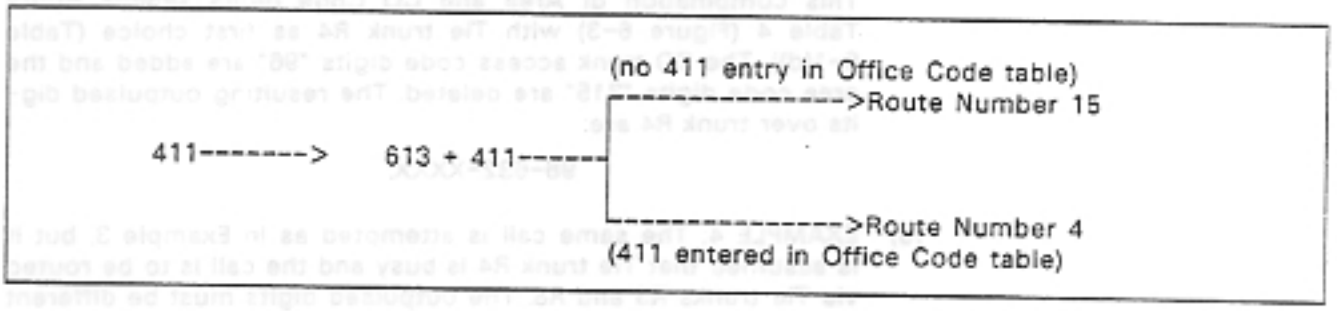


Figure 5-3 411 Entry

5.15 If an extension dials a CO code of 555, the system will recognize that call as a call for directory assistance. If 555 is defined as a CO code in the local Area Code, it will go out on a local trunk. If the CO code is not defined for an area code, 555 calls are given the 411 route. It is important then to assign the 411 service code a particular route.

6. EXAMPLES

6.01 This Part will outline four specific examples. Each case will assume digits are dialed from an extension at a system (SX-100 or SX-200) and listed as 592-2122. Each Trunk Group used within a particular Route Table may require digit insertion and/or deletion to obtain the proper route.

(a) EXAMPLE 1: The caller dials the ARS access code (assumed as digit 7) followed by the required telephone number, i.e.:

7-315-732-XXXX.

Area code 315 selects Route Table 2 (Figure 6-3) and CO trunk R1 is the first choice. The Modify Table adds the digit "1" resulting in the outpulsed digits on R1 as:

1-315-732-XXXX.

(b) EXAMPLE 2: The caller dials the ARS access code and the telephone number as follows:

7-419-662-XXXX.

Area code 419 selects Route Table 3. Tie trunk R3 is the first choice and the CO trunk access code of the associated System (in the "419" area) is "95". The Modify Table deletes area code digits "419" and adds digits "95". The outpulsed digits over the Tie trunk R3 are thus:

95-662-XXXX.

(c) EXAMPLE 3: This call is one made to CO code "632" in Area "315", and making use of Tie trunk R4. The caller dials:

7-315-632-XXXX.

This combination of Area and CO Code digits selects Route Table 4 (Figure 6-3) with Tie trunk R4 as first choice (Table 6-1(d)). The CO trunk access code digits "96" are added and the area code digits "315" are deleted. The resulting outpulsed digits over trunk R4 are:

96-632-XXXX.

(d) EXAMPLE 4: The same call is attempted as in Example 3, but it is assumed that Tie trunk R4 is busy and the call is to be routed via Tie trunks R3 and R6. The outpulsed digits must be different to accommodate the accessing, by trunk R3, of trunk R6 (access code "81"). The outpulsed digits over the Tie trunk R3 will be as follows:

81-96-632-XXXX.

An important point to note in the route selection procedure is that the various access codes for the trunks available at the customer's system (i.e. "82","84","92", etc.) are not required when using the ARS feature. A trunk group is automatically selected according to the Area and/or Office code dialed by the customer.

6.02 The Modify Digits Table can provide up to 12 different sets of digit-modifying sequences, which are each programmed at the time of installation. Each set can be associated with a particular route, and may be used with other routes if the same data is required. The digit-modifying data enables certain digits to be deleted and/or programmed digits to be inserted. Referring to Figure 6-3 it will be seen that a modify digits set (M1, M2, etc.) of the Modify Digits Table is allotted to the Route Table. Each modify digits set is programmed to result in a specific combination of digits which are added to the dial train and/or cause digits to be deleted from the dial train.

6.03 Referring to the specific examples in 6.01, and to the route shown in Table 6-1, it will be found that the digit-modifying data for the Modify Digits Table in respect to the sequences M1 through M5, are as shown in Table 6-2.

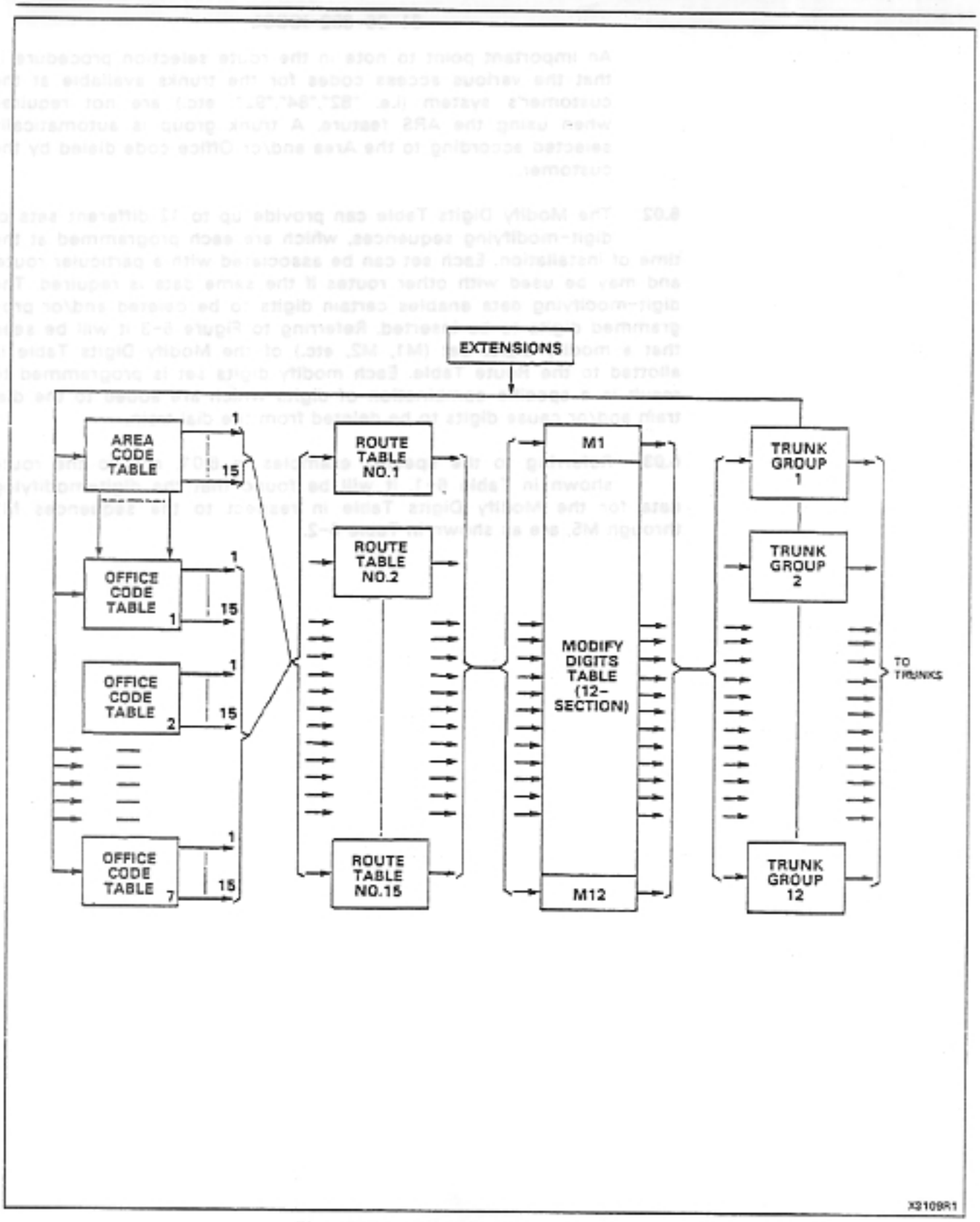


Figure 6-1 ARS Routing Architecture

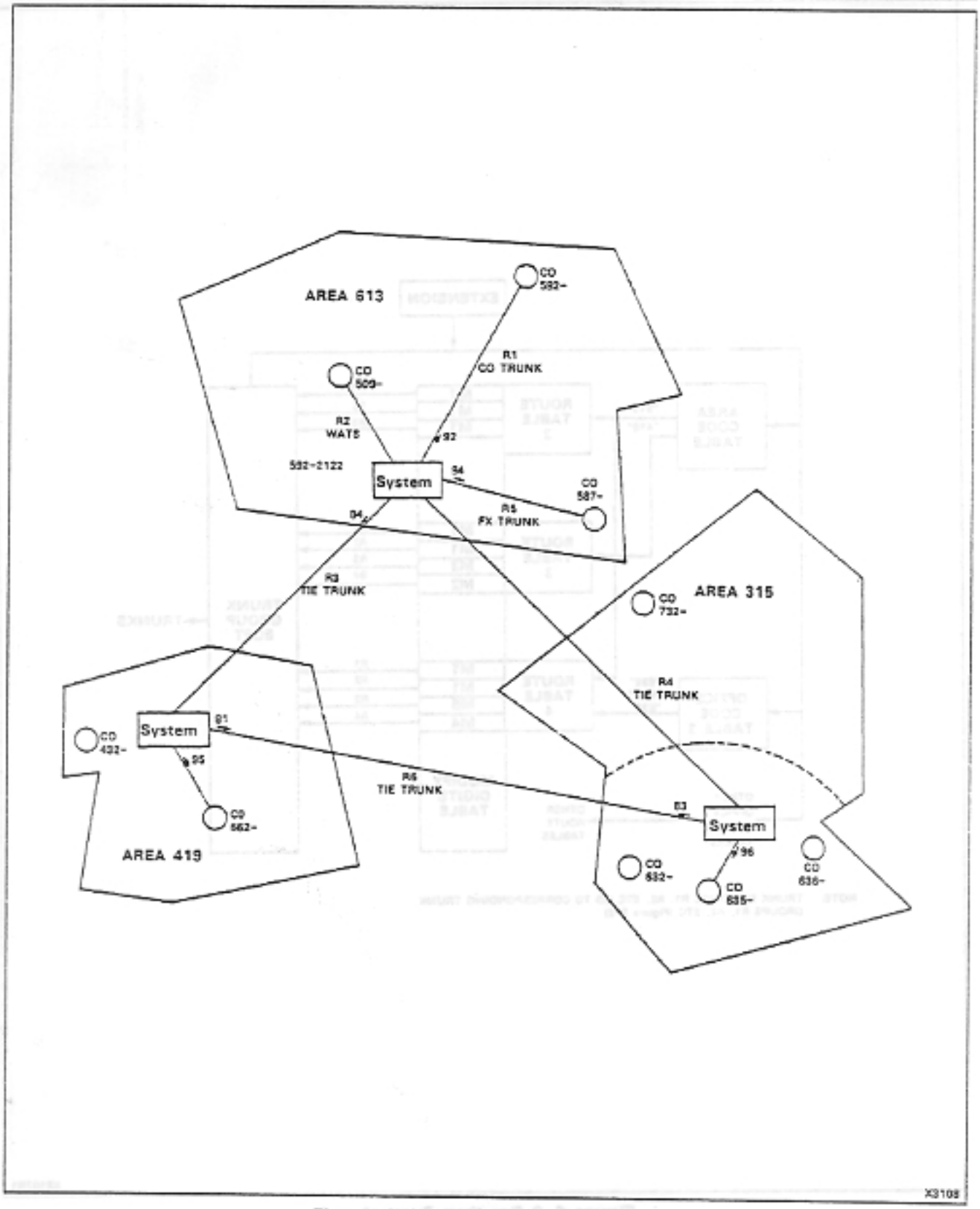
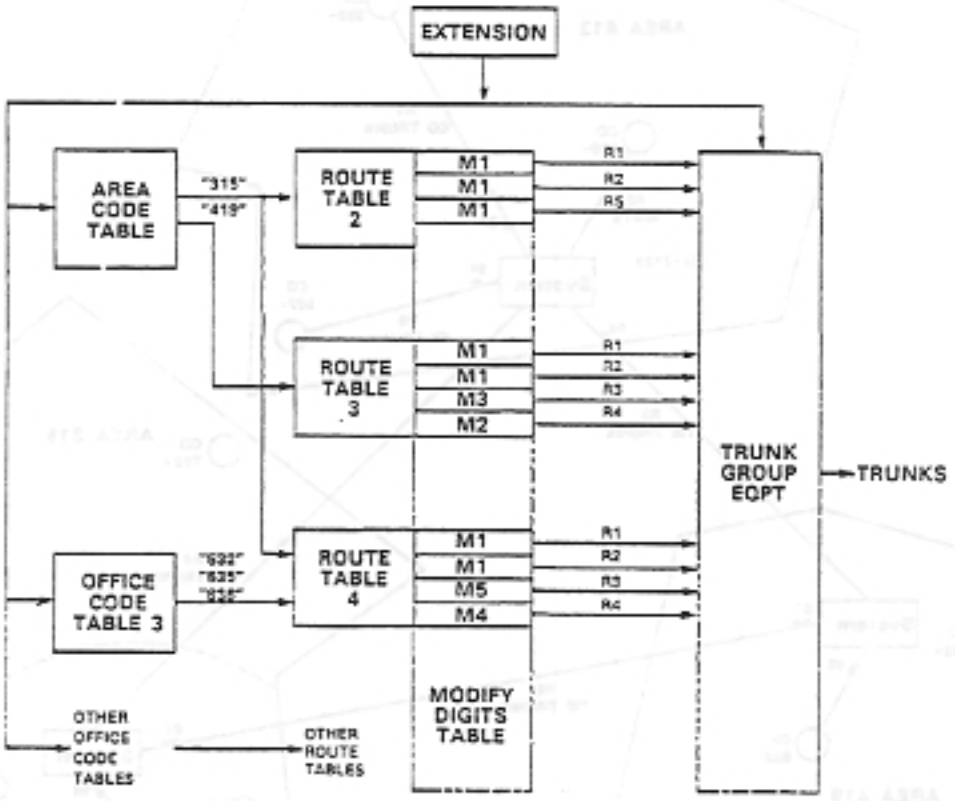


Figure 6-2 Area Routing Example



NOTE: TRUNK ROUTINGS R1, R2, ETC GO TO CORRESPONDING TRUNK GROUPS R1, R2, ETC (Figure 3-2)

X3107R1

Figure 6-3 Routing Examples

TABLE 6-1
ROUTE TABLE SCHEDULE

SCHEDULE	ROUTE CHOICES				TIME SCHEDULE
A	P1	P2	P3	P4	PRIME HOURS
B	S1	S2	S3	S4	SECONDARY HOURS
C	T1	T2	T3	T4	OFF HOURS

(A) BASIC ROUTE DETAILS

SCHEDULE	ROUTE CHOICES				TIME SCHEDULE
A	R1	-	-	-	0800 - 1700 HRS
B	R1				
C	R1	-	-	-	

R1 = CO Trunk

(B) ROUTE TABLE 2, AREA "315" CALLS

SCHEDULE	ROUTE CHOICES				TIME SCHEDULE
A	R3	R4	R2	R1	0800 - 1700 HRS
B	R3	R4	R1	-	1700 - 2200 HRS
C	R3	-	-	-	2200 - 0800 HRS

R1 = CO Trunk
R2 = WATS (Measured Time)
R3 = Tie Trunk
R4 = Tie Trunk

(C) ROUTE TABLE 3, AREA "419" CALLS

SCHEDULE	ROUTE CHOICES				TIME SCHEDULE
A	R4	R3	R2	R1	0800 - 1700 HRS
B	R4	R3	R1	-	1700 - 2200 HRS
C	R4	-	-	-	2200 - 0800 HRS

R1 = CO Trunk
R2 = WATS (Measured Time)
R3 = Tie Trunk
R4 = Tie Trunk

(D) ROUTE TABLE 4, AREA "315" SUBGROUP CALLS

TABLE 6-2
MODIFY DIGITS SEQUENCE EXAMPLE

MODIFY DIGITS SEQUENCE	DIGITS DELETED (NOTE 1)	DIGITS ADDED (NOTE 2)
M1	0	1
M2	3	96
M3	3	8196
M4	3	8395
M5	3	95

Notes: 1. Digits in DIGITS DELETED column are the NUMBER of digits to be selected.
2. Digits in DIGITS ADDED column are ACTUAL digits to be added.

7. PROGRAMMING

General

7.01 Programming the SX-100 or SX-200 system for the ARS feature consists of the following main procedures:

(a) If Multi-Digit Toll Control (see Section MITL9105/9110-090-212-NA) and/or Speed Call (see Section MITL9105/9110-090-220-NA) features are applicable, the implications of these should be considered before any programming of the ARS feature (consult 5.01).

(b) Perform the calculations required to result in the optimum selection of the required routes for the ARS feature.

(c) From the calculations, transcribe the data onto the Installation Forms relating to the ARS feature. Examples of these forms are at the end of this practice.

(d) Ensure that the system is installed with Generic ACD software.

(e) In the Standard Programming mode enter the required System Options, COS Option and ARS Feature Access Code (see Section MITL9105/9110-090-210-NA).

(f) Place the system in the Extended Programming mode. Initialize the extended RAM, if ARS is to be newly programmed. The latter can only be done when the system is idle.

(g) Perform the required extended programming to activate the ARS feature.

(h) When all programming is completed, the console is returned to its normal operational state.

7.02 There are a number of System Options, COS Options and Feature Access Codes which are directly applicable to the Automatic Route Selection feature. These are as follows:

- System Option 238, Automatic Route Selection Enable. This System Option must be set to make the ARS feature valid.

- System Option 242, ARS: Enable Interchangeable Office Codes. This System Option, when enabled, will allow office codes of the type NXX to be recognized in the Local or Home Area. If this Option is enabled the user must dial the digit "1" after the ARS access code (see below) for all long-distance (out-of-Area) calls.

- System Option 239, ARS Return Dial Tone. This System Option, when enabled, will return dial tone after the user dials the ARS access code.

- System Option 240, ARS Dial 0 Time-Out 5 Seconds. This System Option sets the ARS Dial 0 time-out at 5 seconds (paragraph 5.12).

- System Option 241, ARS Dial 0 Time-Out 10 seconds. This System Option sets the ARS Dial 0 time-out at 10 seconds (paragraph 5.12).

- System Option 247, Automatic Wake-Up Music On Hold. This System Option allows the extension user to be connected to (customer provided) Music on Hold while the ARS feature outputs the digits dialed.

- COS Option 96, ARS Route Restriction. An extension with this COS Option enabled in its Class of Service will be barred from accessing the last (most expensive) route in a Route Table.

- COS Option 100, ARS Allowed. An extension with this COS Option enabled will be able to access Trunk Groups not in its COS when directed there by ARS. This option must be enabled for an extension to use ARS.

- COS Option 111, DISA/Extension Routing Direct to ARS. If this Option is enabled in a DISA or extension's COS all calls made on the trunk or extension are routed through the ARS feature.

- COS Option 113, ARS Disallow Schedule A. This Option, when enabled, restricts access to ARS Schedule A.

- COS Option 114, ARS Disallow Schedule B. This Option, when enabled, restricts access to ARS Schedule B.

- COS Option 115, ARS Disallow Schedule C. This Option, when enabled, restricts access to ARS Schedule C.

- COS Option 116, ARS Limited Access. This Option, when enabled, restricts access to trunks routed by ARS to trunks in the caller's COS.

- COS Option 118, ARS Most Expensive Route Warning Tone. This Option, when enabled, provides an audible tone indication to SUPERSET 3™ and standard telephones and a visual note (EXPENSIVE ROUTE) to SUPERSET 4 users when the last ARS route is used.

- Feature Access Code 44, ARS Access Code. This Feature Access Code must be programmed to enable the use of the ARS feature.

Note: The last number redial feature of Speed Call cannot be used with ARS.

ARS Parameters

7.03 As previously mentioned, the number of 9-Entry Tables is dependent upon the number of 800-Entry Tables selected. The total availability of tables required should be carefully determined by the use of Traffic Measurement (Section MITL9105/9110-090-450-NA).

Programming Forms

7.04 The Installation Forms (which are included as part of Volume 3) are as follows:

- Table Quantity

- Area Code Table Programming

- Area Code/Office Codes Programming

- Modify Digits Table Programming

- Route Table Programming.

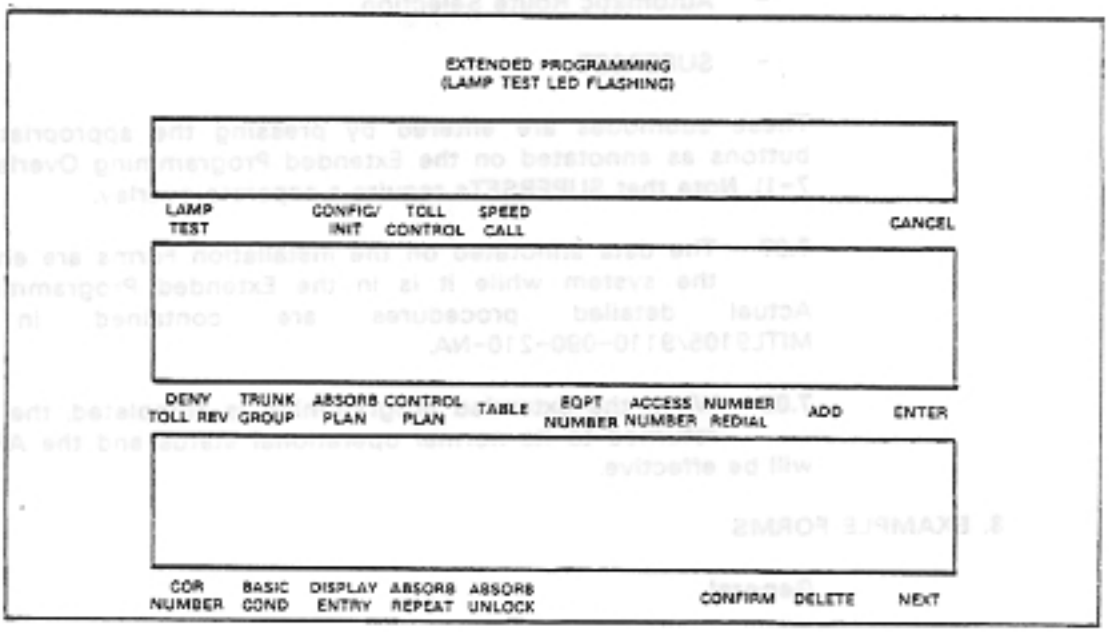
Programming Procedures

7.05 The System Options, COS Options and ARS Feature Access Code are entered in the Standard Programming Code. This programming is described in Section MITL9105/9110-090-210-NA, System Programming. When all Standard programming is completed, the ARS Feature (and the Multi-Digit Toll Control and Speed Call Features if applicable) is programmed in the Extended Programming Mode.

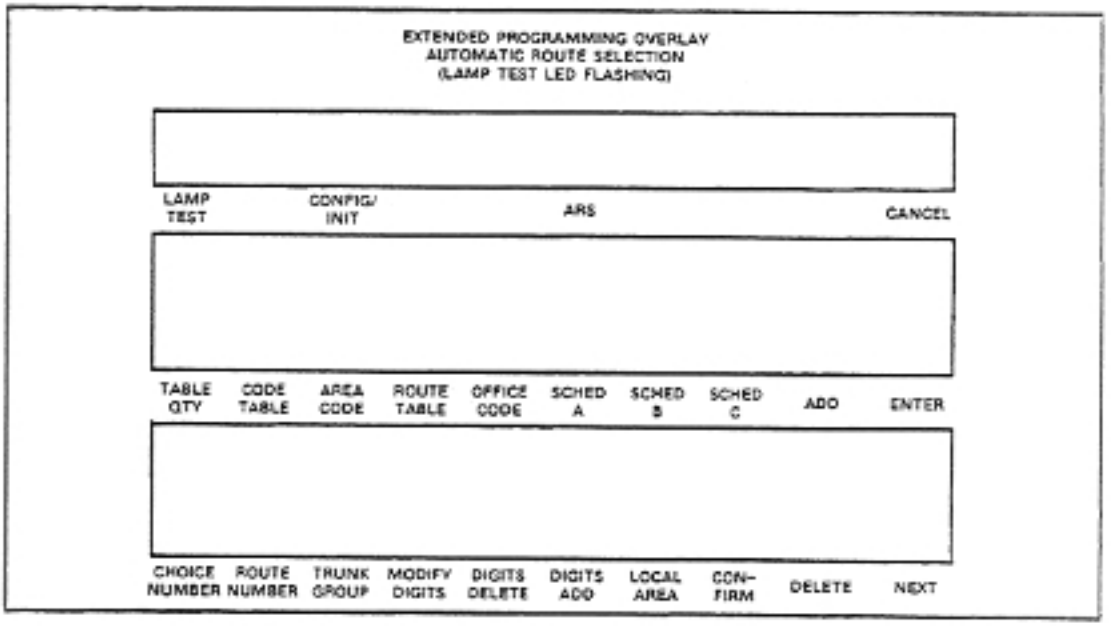
7.06 The Extended Programming Mode has several submodes, as follows:

- Automatic Wake-Up

- Toll Control



EXTENDED PROGRAMMING



ARS PROGRAMMING

XS981

Figure 7-1 Extended Programming Overlays

- Speed Call
- Automatic Route Selection
- SUPERSET

These submodes are entered by pressing the appropriate console buttons as annotated on the Extended Programming Overlays (Figure 7-1). Note that SUPERSETs require a separate overlay.

7.07 The data annotated on the Installation Forms are entered into the system while it is in the Extended Programming Mode. Actual detailed procedures are contained in Section MITL9105/9110-090-210-NA.

7.08 When the extended programming is completed, the system is returned to its normal operational status and the ARS feature will be effective.

8. EXAMPLE FORMS

General

8.01 The following pages are a completed example of the ARS forms that are contained in Section MITL9105/9110-090-210-NA and Volume 3.

CONFIGURATION CHARACTERISTICS

FORM ARS 1

TABLE ARS 1 - 1

800/9 ENTRY CODE TABLE

NUMBER OF 800 ENTRY TABLES	TABLE RANGE	NUMBER OF 9 ENTRY TABLES	TABLE RANGE
0		110	1 - 110
1	1	109	2 - 110
2	1 - 2	108	3 - 110
3	1 - 3	98	4 - 101
4	1 - 4	90	5 - 94
5	1 - 5	85	6 - 90
6	1 - 6	80	7 - 86
7	1 - 7	75	8 - 82
8	1 - 8	70	9 - 78
9	1 - 9	65	10 - 74
10	1 - 10	60	11 - 70
11	1 - 11	55	12 - 66
12	1 - 12	50	13 - 62
13	1 - 13	45	14 - 58
14	1 - 14	40	15 - 54
15	1 - 15	35	16 - 50
16	1 - 16	30	17 - 46
17	1 - 17	25	18 - 42
18	1 - 18	20	19 - 38
19	1 - 19	15	20 - 34
20	1 - 20	10	21 - 30
21	1 - 21	5	22 - 26
22	1 - 22	0	

NOTE 1: AN 800 ENTRY TABLE WILL BE IDENTIFIED BY A PERIOD AFTER THE TABLE NUMBER ON THE DESTINATION DISPLAY) DURING EXTENDED PROGRAMMING

MITEL

CODE TABLE QUANTITY SELECTION

FORM ARS - 2

THE SYSTEM MUST BE IN EXTENDED PROGRAMMING MODE - LAMP TEST LED FLASHING

1. PRESS [ARS] SELECTS ARS MODE

2. PRESS [TABLE QTY] PREPARES FOR INPUT OF TABLE QUANTITY DATA

3. DIAL DIGITS WHICH REPRESENT THE NUMBER OF 800 - ENTRY TABLES REQUIRED

4. PRESS [ENTER] ENTERS TABLE INFORMATION

MITEL

AREA CODE TABLE PROGRAMMING FORM ARS - 3

PRESS [ARS]

PRESS [AREA CODE] DIAL 3 DIGITS	PRESS [ROUTE TABLE] DIAL 1-15 OR DELETE	PRESS [ENTER] NOTE 2
613	15	✓

[AREA CODE] DIAL 3 DIGITS	[ROUTE TABLE] DIAL 1-15 OR DELETE	[ENTER] NOTE 2

[AREA CODE] DIAL 3 DIGITS	[ROUTE TABLE] DIAL 1-15 OR DELETE	[ENTER] NOTE 2

1. TO VIEW AN ENTRY

PRESS [AREA CODE] DIAL 3 DIGITS [NEXT] [NEXT]

TO REASSIGN ROUTE TABLE NUMBERS

PRESS [AREA CODE] DIAL 3 DIGIT AREA CODE [ROUTE TABLE] DIAL 1-15 [ENTER]

NOTE: 1. ROUTE TABLE 15 IS THE UNIVERSAL ROUTING TABLE I.E. AREA CODE DIGITS NOT ENTERED ARE AUTOMATICALLY IN ROUTE TABLE 15.

2. ENTER BUTTON MAY BE PRESSED AFTER ROUTE TABLE ENTRY OR AFTER ALL ROUTE ENTRIES

MITEL

AREA CODE/ OFFICE CODE
PROGRAMMING FORM ARS 4A

PRESS CODE TABLE DIAL TABLE NUMBER (NOTE 1)	PRESS AREA CODE DIAL 3 DIGIT OR DELETE	PRESS ROUTE TABLE DIAL 1-15	PRESS OFFICE CODE DIAL 3 DIGIT CODE OR DELETE	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	DIAL CO CODES	PRESS ENTER AFTER ALL ENTRIES
001	613	01	224	731	236											
			239	770	562											
			567	832	598											
			725	997	741											
			748	232	778											
			825	526	911											
			994	574	237											
			225	733	563											
			411	771	611											
			568	836	745											
			728	998	790											
			749	234	992											
			828	560	238											
			995	595	566											
			226	737	722											
			521	776	746											
			572	838	820											
			729	744	993											
			750	236												
			227	561												
			996	596												
			231	738												
			523	777												
			593	939												

NOTE 1: CODE TABLE NUMBERS ARE DETERMINED FROM FORM ARS-1

AREA CODE/OFFICE CODE PROGRAMMING FORM ARS 4B

FOR LOCAL AREA CODE

LOCAL AREA → DIAL LOCAL AREA CODE → ENTER

TO DELETE, ADD OR VIEW FOR ARS 4A

CODE TABLE → DIAL TABLE NUMBER → DELETE → CONFIRM → ENTER

CODE TABLE → DIAL TABLE NUMBER → AREA CODE → DIAL ROUTE TABLE → ROUTE TABLE → DIAL AREA CODE → OFFICE CODE → 3 DIAL DIGITS → DELETE → ENTER

CODE TABLE → AREA CODE → DIAL ROUTE TABLE → ROUTE TABLE → DIAL AREA CODE → OFFICE CODE → 3 DIAL DIGITS → ENTER

TO VIEW OFFICE WIDE TABLE

CODE TABLE → NEXT → NEXT

TO VIEW OFFICE CODE ENTRIES

OFFICE CODE → NEXT → NEXT

MITEL

MODIFY DIGITS PROGRAMMING FORM ARS-5

PRESS [ARS]

PRESS [MODIFY DIGITS]	PRESS [DIGITS DELETE]	PRESS [DIGITS ADD]	PRESS [ENTER]
DIAL 1-12 (NOTE 1)	DIAL 0-10 (NOTE 2)	DIAL ACTUAL DIGITS TO BE ADDED, UP TO A MAXIMUM OF 20 DIGITS (NOTES 3 AND 4)	FOR EACH LINE
	0	1	

NOTES

1. DIAL DIGITS FOR REQUIRED MODIFY DIGITS TABLE
2. DIAL DIGIT REPRESENTING QUANTITY OF DIGITS TO BE DELETED (E.G. 3 FOR AN AREA CODE)
3. TO ADD DIGITS (E.G. ACCESS CODES TO TANDEM SWITCHING EQUIPMENT) DIAL ACTUAL DIGITS TO BE ADDED
4. THE FOLLOWING SPECIAL SEQUENCES MAY BE ADDED WHERE REQUIRED (TO A MAXIMUM OF 4 SEQUENCES PER LINE)
   - *1 - OCCUPIES 1 DIGIT SPACE AND CAUSES A 1S PAUSE AT THAT POINT
   - *2 - OCCUPIES 1 DIGIT SPACE AND CAUSES A WAIT FOR DIAL TONE AT THAT POINT
   - *4 - OCCUPIES 1 DIGIT SPACE AND CAUSES ALL SUCCEEDING DIGITS TO BE SUPPRESSED FROM S M D R PRINT OUT (APPLIES TO DIGITS AFTER *4 AND BEFORE ANY OTHER *1
   - *5 - OCCUPIES 1 DIGIT SPACE AND CAUSES A 10S PAUSE AT THAT POINT

1. TO DELETE A MODIFY DIGIT TABLE

PRESS [MODIFY DIGITS] DIAL 1-12 [DELETE] [ENTER]

2. TO VIEW ALL MODIFY DIGIT TABLES

PRESS [MODIFY DIGITS] [NEXT] [NEXT]

3. TO VIEW ALL DIGITS ADDED IN A MODIFY DIGITS TABLE

PRESS [MODIFY DIGITS] DIAL 1-12 [DIGITS ADD] [NEXT] [NEXT]

4. TO ADD DIGITS TO A MODIFY DIGITS TABLE

PRESS [MODIFY DIGITS] DIAL 1-12 [DIGITS ADD] DIAL ADD DIGITS [ENTER]

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PRESS [ARS]

ROUTE TABLE PROGRAMMING FORM ARS-6 (1 OF 2)

BASIC SCHEDULE DATA				SCHEDULE CHOICES A			B			C			
PRESS [ROUTE TABLE]	PRESS [ROUTE NUMBER]	PRESS [TRUNK GROUP]	PRESS [MODIFY DIGITS]	PRESS [SCHED A]	PRESS [CHOICE NUMBER]	PRESS [ROUTE NUMBER]	PRESS [SCHED B]	PRESS [CHOICE NUMBERS]	PRESS [ROUTE NUMBER]	PRESS [SCHED C]	PRESS [CHOICE NUMBER]	PRESS [ROUTE NUMBER]	PRESS [ENTER]
DIAL 1-15 OR PRESS DELETE	DIAL 1-4	DIAL 1-12 OR DELETE		DIAL 4 DIGITS OR PRESS DELETE	DIAL 1-4	DIAL 1-4	DIAL 4 DIGITS OR PRESS DELETE	DIAL 1-4	DIAL 1-4	NOTE 1	DIAL 1-4	DIAL 1-4	AFTER EACH BLOCK
01	1	01			1	1		1			1		ENTER
	2				2			2			2		
	3				3			3			3		
	4				4			4			4		
02	1	02		0818	1	1	1823	1	1		1	1	ENTER
	2	01	01		2	2		2			2		
	3				3			3			3		
	4				4			4			4		
15	1	01	01	0020-NOTE 2	1	1		1			1		ENTER
	2				2			2			2		
	3				3			3			3		
	4				4			4			4		

NOTE 1
DO NOT DIAL TIME AFTER PRESSING [SCHED C] BUTTON.
SCHEDULE C IT WILL BE IN EFFECT ANY TIME A OR B ARE NOT.

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ROUTE TABLE PROGRAMMING FORM ARS-8 (2 OF 2)

1. TO DELETE A ROUTE TABLE

PRESS [ROUTE TABLE] DIAL 1-15 PRESS [DELETE] [ENTER]

2. TO DELETE A ROUTE NUMBER BEING DISPLAYED

PRESS [DELETE]

OR

PRESS [ROUTE NUMBER] DIAL 1-4 PRESS [DELETE] [ENTER]

3. TO DELETE A ROUTE CHOICE BEING DISPLAYED

PRESS [DELETE]

OR

PRESS [SCHED X] [CHOICE NUMBER] DIAL 1-4 PRESS [DELETE] [ENTER]

(SCHED "X" IS SCHED A, B, OR C)

4. TO VIEW ROUTE TABLES

PRESS [ROUTE TABLE] PRESS [NEXT] [NEXT]

5. TO VIEW ROUTE CHOICES IN A SCHEDULE

PRESS [ROUTE TABLE] DIAL 1-15 [SCHED A] [NEXT]

6. TO VIEW SCHEDULES IN A ROUTE CHOICE:

PRESS [ROUTE TABLE] DIAL 1-15 [SCHEDULE A]

[SCHEDULE B]

[SCHEDULE C]

7. TO VIEW ROUTES TABLES

PRESS [ROUTE TABLE] DIAL 1-15 [NEXT]

MITEL

9. EXAMPLE PRINTOUT

General

9.0 This Part contains an example printout (Figure 9-1) of the ARS programming shown in Part 8. This printout may be obtained after:

- Connecting a printer to the RS232.
- Dialing 555 + 9 + 6 from the console (where 555 is assumed to be the maintenance function code).
- Pressing the RELEASE button.

9.01 For additional information on this feature see Section MITL9105/9110-090-105- NA, specifically Customer Data Print.

Figure 9-1 ARS PRINTOUT EXAMPLE
AUTOMATIC ROUTE SELECTION

LOCAL AREA CODE 613 — TABLE QUANTITY 03

AREA CODE TABLE
AREA CODE (ROUTE TABLE)

200-15	201-15	202-15	203-15	204-15	205-15	206-15	207-15	208-15	209-15
210-15	211-15	212-15	213-15	214-15	215-15	216-15	217-15	218-15	219-15
300-15	301-15	302-15	303-15	304-15	305-15	306-15	307-15	308-15	309-15
310-15	311-15	312-15	313-15	314-15	315-15	316-15	317-15	318-15	319-15
400-15	401-15	402-15	403-15	404-15	405-15	406-15	407-15	408-15	409-15
410-15	411-00	412-15	413-15	414-15	415-15	416-02	417-15	418-15	419-15
500-15	501-15	502-15	503-15	504-15	505-15	506-15	507-15	508-15	509-15
510-15	511-15	512-15	513-15	514-02	515-15	516-15	517-15	518-15	519-15
600-15	601-15	602-15	603-15	604-15	605-15	606-15	607-15	608-15	609-15
610-15	611-00	612-15	613-15	614-15	615-15	616-15	617-15	618-15	619-15
700-15	701-15	702-15	703-15	704-15	705-02	706-15	707-15	708-15	709-15
710-15	711-15	712-15	713-15	714-15	715-15	716-15	717-15	718-15	719-15
800-15	801-15	802-15	803-15	804-15	805-15	806-15	807-15	808-15	809-15
810-15	811-15	812-15	813-15	814-15	815-15	816-15	817-15	818-15	918-02
900-15	901-15	902-15	903-15	904-15	905-15	906-15	907-15	908-15	909-15
910-15	911-00	912-15	913-15	914-15	915-15	916-15	917-15	918-15	919-15

OFFICE CODE TABLES

TABLE	AREA CODE	RTE TBL	OFFICE CODES									
001.	613	01	224	225	226	231	232	234	235	236	237	238
			239	411	521	523	526	560	561	562	563	566
			567	568	592	593	594	595	596	598	611	722
			725	728	729	731	733	737	738	741	745	746
			748	749	750	770	771	776	777	778	790	820
			825	828	829	832	836	838	839	911	992	993
			994	995	996	997	998	744				

MODIFY DIGITS TABLES

TABLE	DEL. DIG.	ADD DIG.
01	000	1
02	000	
03	000	
04	000	
05	000	
06	000	
07	000	
08	000	
09	000	
10	000	
11	000	
12	000	

ROUTE TABLES

TBL	RTE	TK. GR	MOD. DG.	SCH A CHOICE	RTE	SCH B CHOICE	RTE	SCH C CHOICE	RTE
01	1	01	-	00-24	1	1 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
02	1	02	-	08-18	1	1 18-23	1	1	1 1
	2	01	01		2	2	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
03	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
04	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
05	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
06	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
07	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
08	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -
09	1	-	-	00-24	1	- 00-00	1	-	1 -
	2	-	-		2	-	2	-	2 -
	3	-	-		3	-	3	-	3 -
	4	-	-		4	-	4	-	4 -

ROUTE TABLES (CON'T)

TBL	RTE	TK. GR	MOD. DG.	SCH A CHOICE RTE			SCH B CHOICE RTE			SCH C CHOICE RTE	
10	1	-	-	00-24	1	-	00-00	1	-	1	-
	2	-	-		2	-		2	-	2	-
	3	-	-		3	-		3	-	3	-
	4	-	-		4	-		4	-	4	-
11	1	-	-	00-24	1	-	00-00	1	-	1	-
	2	-	-		2	-		2	-	2	-
	3	-	-		3	-		3	-	3	-
	4	-	-		4	-		4	-	4	-
12	1	-	-	00-24	1	-	00-00	1	-	1	-
	2	-	-		2	-		2	-	2	-
	3	-	-		3	-		3	-	3	-
	4	-	-		4	-		4	-	4	-
13	1	-	-	00-24	1	-	00-00	1	-	1	-
	2	-	-		2	-		2	-	2	-
	3	-	-		3	-		3	-	3	-
	4	-	-		4	-		4	-	4	-
14	1	-	-	00-24	1	-	00-00	1	-	1	-
	2	-	-		2	-		2	-	2	-
	3	-	-		3	-		3	-	3	-
	4	-	-		4	-		4	-	4	-
15	1	1	1	00-24	1	1	00-00	1	-	1	-
	2	-	-		2	-		2	-	2	-
	3	-	-		3	-		3	-	3	-
	4	-	-		4	-		4	-	4	-

SX-100® AND SX-200® SUPERSWITCH® AUTOMATIC CALL DISTRIBUTION SYSTEM SPEED CALL GENERIC ACD

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1. GENERAL

1.01 Speed Call is a feature of the SX-100/SX-200 Automatic Call Distribution (ACD) System fitted with Generic ACD software. This feature allows the use of common-use Speed Call tables by the Supervisor and by selected stations, and of personal tables by selected stations. General descriptions of the SX-100/SX-200 Systems are contained in Section MITL9105/9110-090-100-NA. These Practices also contain a listing of applicable documents for these Systems. Reference to some of these documents are made in this Section.

Reason for Issue

1.02 This Section has been issued to provide Generic ACD information.

SUPERSET 4

1.03 For information pertaining to SUPERSET 4 Speed Call, see Section MITL9105/9110-090-107-NA.

SUPERSET 3

1.04 For information pertaining to SUPERSET 3 Speed Call, see Section MITL9105/9110-090-106-NA.

1.05 The remaining Parts of this Section are concerned with the following areas:

- Part 2 – Description, including architecture of the Speed Call feature, to illustrate the facilities and parameters of the feature.
- Part 3 – Programming requirements to implement the Speed Call feature. This is supported by MAPs which are contained in Section MITL9105/9110-090-210-NA.
- Part 4 – Definition of the Speed Call numbers within the tables, by the station user and the Supervisor.
- Part 5 – The display of Speed Call numbers at the Supervisor Console.
- Part 6 – The usage of Speed Call numbers.
- Part 7 – External Call Forwarding (ECF).

2. SYSTEM DESCRIPTION

General

2.01 The basic elements of the Speed Call feature are Speed Call tables, which are used to store Speed Call numbers; these have been defined (entered) by the Supervisor as common-use Speed Call numbers, or defined (entered) by selected station users for their personal use. A Speed Call number consists of the outgoing Trunk Group access number, and the proper number of digits required to obtain the desired party. The Speed Call number is called up and applied to the trunk circuit, by the user dialing a Speed Call feature access code,

followed by the Speed Call entry access number assigned for that Speed Call number.

2.02 The foregoing overview is discussed in detail in the following paragraphs. In addition a simplified typical system is discussed in 2.16, to which reference may be made while reading the following paragraphs.

System Speed Call Tables

2.03 There is only one type of system Speed Call table and it has the following characteristics:

- It has the capacity of containing a maximum of 56 digits.
- The table can contain a maximum of five separate Speed Call numbers, each of any number of digits, provided that the total number of digits does not exceed 56.

2.04 The tables may be programmed for use as:

(a) Common-use tables, whereby the Supervisor and selected stations may make use of the tables on a Class-of-Service basis to dial calls external to the System.

(b) Personal tables, which are dedicated for a selected station's use.

Note: The assignment of these tables is done at the time of programming.

Table Assignments

2.05 Tables are assigned during programming (Part 3), for use as common-use or personal tables. Those assigned for common use may be accessed by the Supervisor, or by stations with the necessary Class-of-Service Options (2.19). A personal table may only be accessed by the station which has been assigned that table during programming. These table assignments are further discussed in the following paragraphs.

Common-Use Tables

2.06 Any station may access the Speed Call numbers in the common-use tables, under the following conditions:

- The station's Class of Service (COS) has the COS option (Table 2-2) which allows access to a particular common-use table.
- If the station user has a personal table Speed Call entry access number which is the same as that for a common-use table, only the personal table will be accessed.

2.07 Speed Call numbers for common-use tables are entered by the Supervisor. These numbers may also be displayed or changed by the Supervisor on the console, except for those numbers which

have been assigned the attribute "confidential". Numbers may be set as confidential at the time the number is entered. Once set, the number cannot be changed or reentered unless System Option 288 has been set, and cannot be displayed unless System Option 289 has been set.

Personal Tables

2.08 In contrast to common-use tables, a personal table is one which can only be used by the one station to which it has been assigned during programming. A station may have more than one table (up to a maximum of 18) assigned to it. The following are other characteristics of assigned personal tables:

(a) The station user enters the numbers, which are required to be stored in the station's table(s) (Part 4).

(b) Personal table numbers cannot be displayed, and can be deleted or changed only by the station user.

(c) The assignment of a table for personal table use precludes the use of that table as a common-use table, or as a personal table for any other station.

Accessing Speed Call Numbers

2.09 Every Speed Call number (common-use or personal) is accessed by an access code consisting of two parts, which are the Speed Call feature access code and the Speed Call entry access number.

2.10 Feature 32 when enabled allows a 1- to 4-digit number to be assigned and programmed as the feature access code. The Speed Call entry access numbers are predefined as 2-digit numbers, within the range of 10-99. Therefore the number of required digits to access a Speed Call number may be a minimum of three. The characteristics of the Speed Call entry access numbers for common-use tables are discussed in 2.11 and those for personal tables are discussed in 2.13.

Common-Use Speed Call Access

2.11 Speed Call entry access numbers for common-use tables are nonprogrammable, and each entry access number accesses a particular number entry in a particular table, as shown in Table 2-1. The first Speed Call entry access number accesses the first Speed Call number in a table, the second Speed Call access number accesses the second Speed Call number in the same table, and so on. If a table has less than five Speed Call numbers, the unused access numbers will be ineffective.

2.12 It should be noted that any of the first 18 tables may be programmed as a personal table if required, in which case it will not be available as a common-use table. Common-use tables are

TABLE 2-1
SPEED CALL ACCESS NUMBERS
COMMON-USE TABLES

Table Number	Speed Call Entry Access Number Range	Table Number	Speed Call Entry Access Number Range
1	10-14	10	55-59
2	15-19	11	60-64
3	20-24	12	65-69
4	25-29	13	70-74
5	30-34	14	75-79
6	35-39	15	80-84
7	40-44	16	85-89
8	45-49	17	90-94
9	50-54	18	95-99

made available to groups of stations by setting Class-of-Service options (see Figure 2-1).

Personal Speed Call Access

2.13 The groups of Speed Call entry access numbers are the same for personal table users as those for common-use tables. Distinctions between the use of these two groups of Speed Call entry access numbers are listed below:

(a) Speed Call entry access numbers for personal tables are selected and are programmed when the table is assigned to an extension (Section MITL9105/9110- 090-210-NA).

(b) Speed Call entry access numbers are not predefined on a one-to-one basis with a table, as is the case for common-use tables (Table 2-1). See the typical example in Figure 2-1 which shows that Access Number Range 10-14 is fixed for Table 1, but the same range is programmed for Table 11 when it is a personal table.

2.14 Other points with regard to personal table Speed Call entry access numbers are as follows:

(a) Two or more personal tables assigned to one station cannot have the same group of access numbers.

(b) More than one station may have the same group of Speed Call entry access numbers, because each personal table is unique to that station.

(c) A Speed Call entry access number range, programmed for a personal table, precludes the user from accessing a common-use table bearing the same number range even if the COS options would allow it.

Saved Number Redial

2.15 A saved number redial facility can exist only for a personal table user. This attribute can only be added when programming, and can only be used with a DTMF telephone. It is always held by the last access number of the personal table. Only one number may be stored for redial even though more than one table may be assigned to the extension. When the attribute is programmed, the number of digits available for the "saved" number are the digits remaining, after the entries for the other telephone numbers in the table. Note that the "saved" number includes one or more digits for Trunk Group access. For further details refer to 4.10 and 6.06.

Note: The saved number redial facility can not be used with ARS.

System Example

2.16 In order to illustrate the description of the Speed Call feature, an example is given in Figure 2-1. This example should not be considered typical, in that certain aspects have been emphasized to illustrate all possible combinations which may occur under different circumstances. These aspects are discussed with respect to the following areas:

- Table Assignments
- Speed Call Entry Access Numbers
- COS Options
- Class of Service.

2.17 The tables (as shown in Figure 2-1), are assigned as a mix of common-use and personal tables. Tables 19 through 25 may be used only as personal tables. Tables are assigned in pairs by means of COS options (Table 2-2), when used as common-use tables, but are separately assignable when used as personal tables. For example, Tables 18, 24 and 25 are shown as assigned to Extension 403.

TABLE 2-2
SPEED CALL TABLE COS OPTIONS

COS Option	Tables
85	1 and 2
86	3 and 4
87	5 and 6
88	7 and 8
89	9 and 10
90	11 and 12
91	13 and 14
92	15 and 16
93	17 and 18

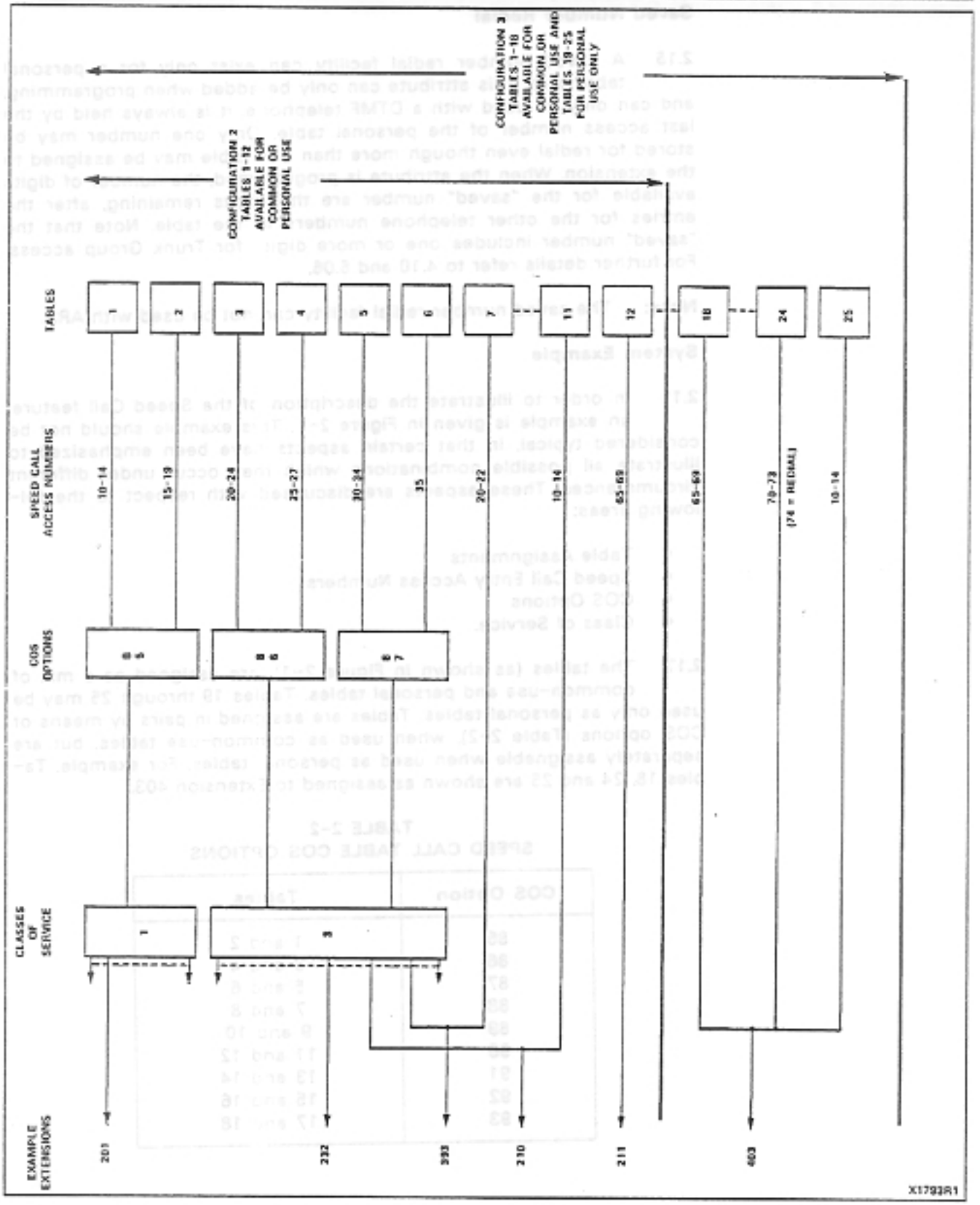


Figure 2-1 Speed Call System Allocations

2.18 The assignment of Speed Call entry access numbers shown in Figure 2-1 emphasizes the following points:

(a) Some tables may not require the maximum range of Speed Call entry access numbers (e.g., that for Table 4 shows only three access numbers: 25, 26 and 27). This may be due to the need to store numbers of excessive length, or the need simply to store no more than three numbers in this Table.

(b) The last number of an access range for a personal table can be used for saved number redial (2.15) (e.g., access number 74 for Table 24).

(c) Tables 12 and 18 have the same access numbers, which is permissible for personal table use (2.14 (b)).

(d) Tables 3 and 7 have some duplicate access numbers. The system precludes the station assigned to Table 7 (personal use) from accessing these duplicate numbers in Table 3, (common-use) even though the COS options allow it (2.14 (c)).

2.19 The COS option, when programmed in a particular Class of Service, allows access of its associated tables to the common users which have been programmed for that Class of Service. Table 2-2 is a list of the COS options which control access to common-use tables, and show which COS options allow access to which common-use tables. However, if a particular table has been programmed as a personal table, it cannot be used as a common-use table (2.08 (c)). All or any combination of Speed Call COS options can be assigned to any COS.

2.20 It should be noted that a station with a personal table may also have access to a common-use table, provided that the station user is also a member of that Class of Service which can access the common-use table. However, if the user has a personal table which has an access number which is identical to that for a common-use table entry, then when that access number is dialed the user will access the personal table, not the common-use table, although the user has the COS option for that table programmed in the Class of Service.

2.21 Programming the Classes of Service will determine which groups of stations may access particular groups of common-use tables. For example, in Figure 2-1 the members of Class of Service Number 1 may only access Tables 1 and 2. These Classes of Service can then determine the particular needs of groups of stations within a system, and configured accordingly. Table 2-3 illustrates the various parameters discussed above, as they apply to Figure 2-1.

TABLE 2-4
SPEED CALL OPERATING CHARACTERISTICS

(See Figure 2-1 for which the following characteristics apply.)

Extension Number	Speed Call Table Number	Speed Call Entry Access Number	Characteristics
201	1 and 2	10-14; 15-19	Extension 201 is a member of Class of Service 1 with Speed Call access to Tables 1 and 2.
232	3 to 6	20-24; 25-27; 30-34; 35	Extension 232 is a member of Class of Service 3 with Speed Call access to Tables 3 through 6. Not all of the table access codes are used.
393	3 to 6, 7	20-22; 25-27; 30-34; 35	Extension 393 has same COS access to Tables 3 to 6 as Extension 232 except as noted. Table 7 is added as a personal table, with access numbers 20-22. Extension 393 will not be able to access the Speed Call numbers held in Table 3 because it has a personal table with the same access numbers as Table 1.
210	3 to 6, 11	20-24; 25-27; 30-34; 35; 10-14	Extension 210 has the same Speed Call access as Extension 232 but with the additional access to personal Table 11. Note that Tables 1 and 11 have similar access numbers, but the extension cannot access Table 1 because it has a personal table with the same access numbers as Table 1.
211	12	65-69	Extension 211 has access only to personal Table 12. Tables 12 and 18 have the same access number range, but because they are programmed for different extensions no conflict arises (see 2.14(b)).
403	18, 24 25	10-14; 65-69; 70-73	Extension 403 has access only to personal Tables 18, 24 and 25. The last access number for Table 24 is programmed as a Saved Number Redial number (see 2.15).

3. PROGRAMMING

General

3.01 Programming the SX-100/SX-200 for the Speed Call feature consists of the following steps.

(a) Complete the Installation Forms (in Volume 3) with respect to Speed Call. Examples showing typical entries are shown in Figures 3-1 and 3-2.

(b) Ensure that the System is fitted with Generic ACD Software.

(c) In the programming mode enter the System options, Speed Call feature access code and COS options required for Speed Call (see Section MITL9105/ 9110-090-210-NA).

(d) Place the System in the Extended Programming Mode, initialize the extended RAM and choose the proper configuration (see (b)). This may only be performed when the system is idle.

(e) Perform the required programming to enable the Speed Call feature. This procedure is amplified in 3.09-3.12. This step is only necessary if personal Speed Call tables have to be assigned.

(f) When all programming is completed, the console is returned to the normal operational state. The defining of Speed Call numbers is done in this state as detailed in Part 4.

Installation Forms

3.02 The following Speed Call Installation Forms are supplied with Section MITL 9105/9110-090-205-NA and Volume 3.

- Form SC-1 Speed Call Table Allocations
- Form SC-2 Personal Table Programming Form.

3.03 Form SC-1 is used to list a Speed Call table as a common-use table or as a personal table. It includes data concerning the equipment number and COS assignments, and whether the saved number redial facility is enabled for any of the tables. This information is tabulated and then used in conjunction with Form SC-2 to perform table programming. The information is also used to provide the Supervisor, and a personal table user with basic data (required to define the speed call numbers). An example of Form SC-1, based on Figure 2-1, is shown in Figure 3-1.

3.04 The personal table information compiled on Form SC-1 is entered on Form SC-2. This form is used to program the required data as detailed in later paragraphs. Upon completion of programming the Speed Call entry access number, and whether the saved number redial is enabled, is entered on the Speed Call Number Record Card

MITEL SPEED CALL TABLE ALLOCATIONS FORM SC-1

TABLE NUMBER	ENTRY ACCESS NUMBERS		EDPT NUMBER	REDIAL	CLASS OF SERVICE															
	COMMON-USE	PERSONAL			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	10-14				✓															
2	15-19				✓															
3	20-24						✓													
4	25-29						✓													
5	30-34						✓													
6	35-39						✓													
7	40-44	20-24	048																	
8	45-49																			
9	50-54																			
10	55-59																			
11	60-64	10-14	025																	
12	65-69	65-69	037																	
13	70-74																			
14	75-79																			
15	80-84																			
16	85-89																			
17	90-94																			
18	95-99	65-69	165																	
19																				
20																				
21																				
22																				
23																				
24		70-74	165	✓																
25		10-14	165																	

NOTES: 1. IF TABLE IS TO BE ASSIGNED AS A PERSONAL TABLE, STRIKE OUT COMMON-USE ENTRY ACCESS NUMBERS. ENTER NEW ENTRY ACCESS NUMBERS IN PERSONAL COLUMN.
2. CHECK IN REMAINING COLUMNS AS REQUIRED FOR EACH TABLE

Figure 3-1 Sample Entries, Form SC-1

(3.13). Example entries, again based on Figure 2-1, are shown in Figure 3-2.

Standard Programming

3.05 The data entered on Forms SC-1 and SC-2 are used to program the Speed Call feature as described in the following paragraphs.

3.06 The Speed Call options and features are entered at the same time as those for other options and features needed for the System user's requirements, and in the following sequence:

- System Options
- Feature Access Code
- COS Options.

3.07 A feature access code has to be assigned for Speed Call. This feature number is 32, and it must be programmed in the Standard Programming Mode, in the same manner as other feature access codes. To minimize the number of digits to be dialed for Speed Call the access code should preferably be a single-digit code. A conflicting single-digit entry access code of the form N# must not be assigned. It is used to access the following functions:

- Outdialing Speed Call numbers from the stations, or from the Supervisor consoles (Part 6).
- Definition or deletion of Speed Call numbers (Part 4) from stations or from the Supervisor consoles.

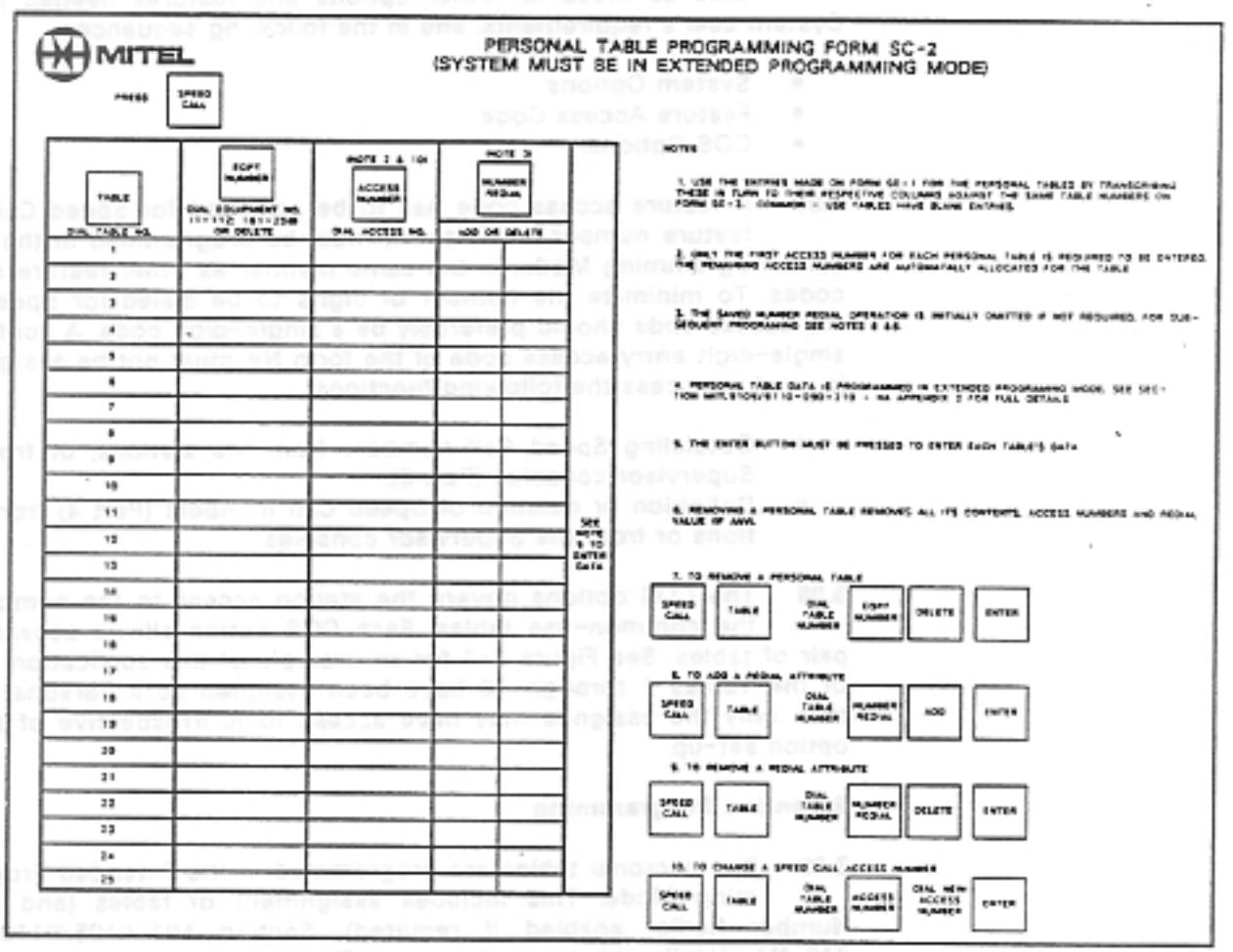
3.08 The COS options govern the station access to the numbers in the common-use tables. Each COS option allows access to a pair of tables. See Figure 2-1 for an example of this application. If any of the Tables 1 through 18 have been assigned as a personal table, then only the assignee may have access to it, irrespective of a COS option set-up.

Extended Programming

3.09 The personal tables are programmed in the Extended Programming Mode. This includes assignment of tables (and Saved Number Redial enabled if required). Section MITL9105/9110-090-210-NA details this procedure, and Figure 3-3 shows the Extended Programming Overlay which is used for this procedure.

3.10 Tables are automatically allotted as common-use tables when the System is initialized and thus do not require programming. When a table is programmed as a personal table (3.11), it negates the use of that table as a common-use table. Subsequent deletion of a personal table restores the table as a common-use table (see Section MITL9105/9110-090-210-NA).

3.11 While in the Extended Programming Mode the personal tables are programmed by using the information which had been previously recorded on SC-2. Figure 3-2 is an example of entries made in



MITEL

PERSONAL TABLE PROGRAMMING FORM SC-2
(SYSTEM MUST BE IN EXTENDED PROGRAMMING MODE)

PRESS SPEED CALL

TABLE (DIAL TABLE NO.)	SOFT NUMBER (DIAL EQUIPMENT NO. OR DELETE)	NOTE 2 & 10 ACCESS NUMBER (DIAL ACCESS NO.)	NOTE 3 NUMBER REDIAL (ADD OR DELETE)	
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

SEE NOTE 9 TO ENTER DATA

NOTES

1. USE THE ENTRIES MADE ON FORM SC-1 FOR THE PERSONAL TABLES BY TRANSCRIBING THESE IN TURN TO THEIR RESPECTIVE COLUMNS AGAINST THE SAME TABLE NUMBERS ON FORM SC-2. COMMON USE TABLES HAVE BLANK ENTRIES.

2. ONLY THE FIRST ACCESS NUMBER FOR EACH PERSONAL TABLE IS REQUIRED TO BE ENTERED. THE REMAINING ACCESS NUMBERS ARE AUTOMATICALLY ALLOCATED FOR THE TABLE

3. THE SAVED NUMBER REDIAL OPERATION IS INITIALLY OMITTED IF NOT REQUIRED. FOR SUBSEQUENT PROGRAMMING SEE NOTES 8 & 9.

4. PERSONAL TABLE DATA IS PROGRAMMED IN EXTENDED PROGRAMMING MODE. SEE SECTION MITL9105/9110-090-219 - NA APPENDIX 2 FOR FULL DETAILS

5. THE ENTER BUTTON MUST BE PRESSED TO ENTER EACH TABLE'S data

6. REMOVING A PERSONAL TABLE REMOVES ALL ITS CONTENTS, ACCESS NUMBERS and REDIAL VALUE IF ANY.

7. TO REMOVE A PERSONAL TABLE

SPEED CALL | TABLE | DIAL TABLE NUMBER | SOFT NUMBER | DELETE | ENTER

8. TO ADD A REDIAL ATTRIBUTE

SPEED CALL | TABLE | DIAL TABLE NUMBER | NUMBER REDIAL | ADD | ENTER

9. TO REMOVE A REDIAL ATTRIBUTE

SPEED CALL | TABLE | DIAL TABLE NUMBER | NUMBER REDIAL | DELETE | ENTER

10. TO CHANGE A SPEED CALL ACCESS NUMBER

SPEED CALL | TABLE | DIAL TABLE NUMBER | ACCESS NUMBER | DIAL NEW ACCESS NUMBER | ENTER

Figure 3-2 Sample Entries, Form SC-2

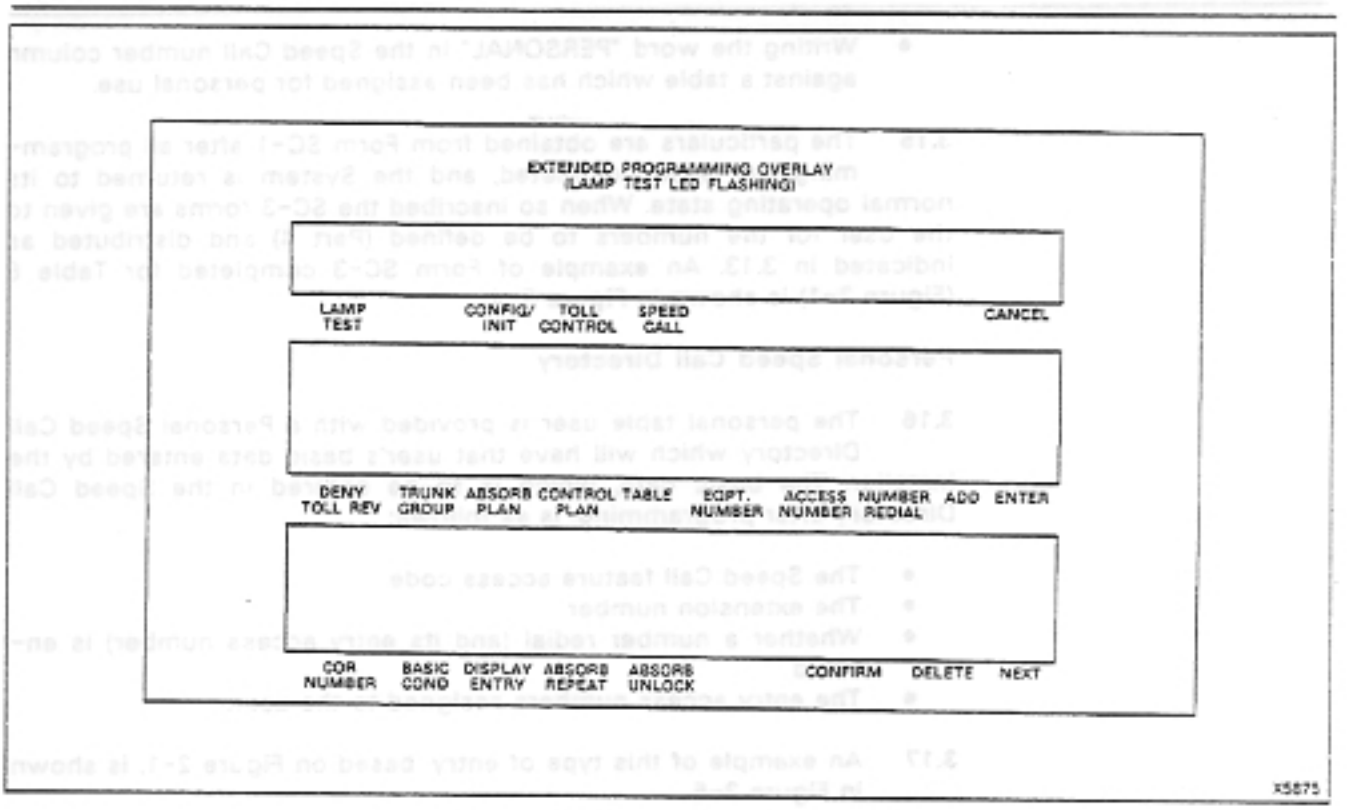


Figure 3-3 Programming Console Overlay

Form SC-2 and shows the programming procedure. In addition Section MITL9105/9110-090-210-NA details these procedures, and includes typical display examples.

3.12 When all extended programming is completed, the System is returned to its normal operational state (see Section MITL9105/9110-090-210-NA), in order that the actual Speed Call numbers may be entered in the enabled tables as detailed in Part 4.

Speed Call Number Record Cards

3.13 The Speed Call Number Record Form SC-3 is intended to be a record of common-use Speed Call numbers for the user. Initial basic data is entered on the form by the installer and then handed to the user for completion. When completed, the user compiles lists of the Speed Call numbers together with their Entry Access numbers, according to the Class of Service and distributes them to the relevant stations of concern. Form SC-3 is maintained by the user as a master record which may be subsequently updated when changes occur.

3.14 Each Speed Call Number Record card is inscribed by the installer with regard to the following particulars:

- The COS numbers to indicate the group of stations (Class of Service) which will access the common-use table.
- The Speed Call feature access code.

- Writing the word "PERSONAL" in the Speed Call number column against a table which has been assigned for personal use.

3.15 The particulars are obtained from Form SC-1 after all programming has been completed, and the System is returned to its normal operating state. When so inscribed the SC-3 forms are given to the user for the numbers to be defined (Part 4) and distributed as indicated in 3.13. An example of Form SC-3 completed for Table 6 (Figure 2-1) is shown in Figure 3-4.

Personal Speed Call Directory

3.16 The personal table user is provided with a Personal Speed Call Directory which will have that user's basic data entered by the installer. The basic data, which is to be entered in the Speed Call Directory after programming, is as follows:

- The Speed Call feature access code
- The extension number
- Whether a number redial (and its entry access number) is enabled
- The entry access numbers assigned to the user.

3.17 An example of this type of entry, based on Figure 2-1, is shown in Figure 3-5.

4. DEFINITION OF SPEED CALL NUMBERS

General

4.01 Speed Call numbers are defined (entered into the tables) by the user. The user is either the Supervisor, for numbers to be defined in the common-use tables, or the station user for numbers to be defined within the personal table(s).

4.02 The personal table user cannot define the last number in his allotted table if it has been enabled for the Saved Number Redial facility (2.15). Note that a personal user may have more than one personal table, but only one table of a set can have the saved number redial facility.

4.03 The installer writes the necessary information on the Speed Call Number Record cards (3.13) or in the Personal Speed Call Directory (3.16), which are given to the user. The customer uses this information in conjunction with the Speed Call number - defining procedure as described below, and the instructions contained on these documents.

Defining Personal Numbers

4.04 The dialing sequence for a station to define a personal Speed Call number is shown in Table 4-1. During Step 4 special key sequences may be entered as required. These key sequences may be entered to provide the following facilities:

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SPEED CALL NUMBER RECORDS FORM SC-3 (Sheet 1 of 4)

CONFIDENTIAL WHEN COMPLETED

SPEED CALL FEATURE CODE .....

SPEED CALL NUMBER

Special sequences can be entered at any point in the telephone number listing
EXCEPT *6, IT MUST BE ENTERED AT THE END
*1 occupies 1 digit space and causes a 3 sec. pause in use
*2 occupies 1 digit space and causes a 3 sec. wait for dial tone
*3##(occupies 2 digit spaces and enables manually-dialed digits to be entered
represents the number of digits to be dialed
*6 Specifies intercom connection

TABLE	COS	ENTRY ACCESS NUMBER	1 … 5 … 10 … 15 … 20 … 25 … 28	DIGITS USED	DIGITS DIALED	CALLED PARTY
1		10				
2		15				
3		20				

LISTING YOUR NUMBERS

1. Tables available for use are indicated on the form by the installer. Your Feature Access Code and Classes of Service also have been entered.
2. Opposite the first available entry access number, write in your first telephone number including the trunk group access code. You can use special sequences like above.
3. Write in the next entry access number, under the first entry number, using a fresh line and continuing with the next telephone number opposite this second entry number.
4. Complete your list of numbers following the above procedure.

SEE CONSOLE OPERATING INSTRUCTIONS FOR OTHER DETAILS

INSTRUCTIONS FOR USER (ATTENDANT)

How to Enter or Change a Number

5. Dial Feature Access Code.
6. Dial 0.
7. Dial entry access number required.
8. Dial telephone number for that entry number.
9. Press the RELEASE button.
10. Repeat the above sequences for each of the remaining entries on the list.

How to Delete a Number

11. Perform Steps 5 through 9 but omit Step 8.

How to Dial a Speed Call Number

12. Dial Feature access code.
13. Dial entry access number.
14. Call proceeds in usual manner.

P/N 1910-037-012-NA

Figure 3-4 Sample Entries, Form SC-3

LISTING YOUR SPEED CALL NUMBERS

Essential data for your use is entered at the right by the installer.

Use only the ranges of checked Entry Access numbers. On the following tables write in the first of your Entry Access numbers followed by your first telephone number. The number must have the Trunk Group access digit(s) entered first. Use the "T" column to keep a tally of digits entered. Use a fresh line to enter the next Entry Access number and its associated telephone number.

Note the information at the foot of each table.

Extension Number:

Feature Access Code:

Entry Access Numbers:

10–14		35–39		60–64		85–89	
15–19		40–44		65–69		90–94	
20–24		45–49		70–74		95–99	
25–29		50–54		75–79			
30–34		55–59		80–84			

EXAMPLE ONLY

Figure 3–5 Sample Entries, Personal Speed Call Directory

TABLE 4-1
DEFINING PERSONAL TABLE NUMBERS

Step	Action	Remarks
1	Lift handset	Listen for dial tone.
2	Dial Speed Call access code	Reorder tone is returned if System Option 287 Speed Call Enable is not set.
3	Dial 0	A short tone burst is heard indicating that the system is ready to accept the Speed Call number.
4	Dial Speed Call entry access number	Reorder tone is returned if the entry access number does not exist for the assigned table.
5	Dial Speed Call number	1. First digit(s) entered must be that for the Trunk Group access. 2. If a digit is input which would cause an overflow of the table, reorder tone is returned when it is entered. Going on-hook clears the number being entered. 3. Special key sequences may be entered. See 4.04.
6	Go on-hook	Terminates definition of number. If no number was dialed (Step 5), then any entry which may have been held is cleared.

- Key Sequence "*1". This code causes a 5 second pause to occur when the number is used. This may be required when a trunk is first seized. This code may be entered at any point and more than once. The system inserts a pause without this entry after the Trunk Group access code, if the speed-dialed number is used by the Supervisor.
- Key Sequence "*2". This code causes the number not to be outpulsed until dial tone is obtained. This code may be entered at any point and more than once. The system waits for dial tone after the Trunk Group access code without this sequence, if the speed-dialed number is used by an extension. A "*2" sequence after the Trunk Group access code would be ineffective. System Option 136 (limited wait for dial tone) is applicable to this entry.
- Sequence "*3QQ". When entered at any point within the number, it enables user-dialed digits to be inserted. See 4.05 for details of this facility. Only one "*3QQ" entry can be made per Speed Call number.
- Sequence "*5". When entered after a legitimate SUPERSET access code, allows a caller to immediately access the SUPERSET's call announce port.

4.05 The key sequence "*3QQ" may be inserted at a required point within the Speed Call number (Step 4, Table 4-1), to enable the station to manually dial digits at this point when the number is being used. The "QQ" portion of the key signifies the number of digits which are to be manually dialed, and has a range of 01 to 16. This number must include the leading 0 when being entered. Only one set of manually dialed digits is allowed for each Speed Call number.

4.06 The special key sequences occupy digits within the table as follows:

- Key Sequence "*1" occupies 1-table digit
- Key Sequence "*2" occupies 1-table digit
- Key Sequence "*3QQ" occupies 2-table digits.
- Key Sequence "*5" occupies 1-table digit.

4.07 The special key sequences require a DTMF telephone for their entry, but once entered a DTMF or rotary-dial telephone may be used to employ the sequences. See Figure 3-4 which illustrates special key sequences and note the digit count for these sequences.

Defining Common-Use Numbers

4.08 The dialing sequence at the console keypad to define a common-use Speed Call number is similar to that for the station (4.04) and is shown in Table 4-2. Common-use numbers may only be defined by the Supervisor.

4.09 The special key sequences (4.04) for personal table users are also effective for common-use numbers. In addition when a common-use table number is to have a confidential attribute, the sequence *4 is entered (Step 4, Table 4-2) at any point within or at the end of the Speed Call number. This inhibits the display of that number by the Supervisor unless System Option 289 has been enabled. It should be noted that personal tables can only be programmed by an extension.

Saved Number Redial

4.10 The saved number redial procedure is applicable only to personal table users (stations), and only if the number redial attribute has been programmed (2.16), for the last Speed Call entry access number of the table. Only DTMF telephones can "save" a number dialed on a trunk.

4.11 To store a number for subsequent use the station user dials "*" within 10 seconds after the last digit dialed on the trunk circuit.

4.12 This procedure causes the following sequence to take place:

(a) Deletion of a previous "saved" number if it had been stored in the table.

TABLE 4-2
DEFINING COMMON-USE TABLE NUMBERS

Step	Action	Remarks
1	Dial Speed Call access code	Reorder tone is returned if System Option 287 is not set.
2	Dial 0	
3	Dial Speed Call entry access number	1. Reorder tone is returned if System Option 288 is not set, or 2. The number was previously programmed as confidential and System Options 288 and 289 are not set, or 3. The access number given references a table which has been assigned as personal.
4	Dial Speed Call number	1. First digit(s) entered must be that for the Trunk Access Group. If not entered it will cause an aborted call when used. 2. If a digit is entered which would cause an overflow of the table, reorder tone is returned when it is entered. Pressing the CANCEL key clears the number being entered. 3. Include the sequence *4 if the number is to be confidential. See 4.09
5	Press console RELEASE Key	Terminates definition of number

(b) The dialed number including the Trunk Group access code is stored as the last number of the Speed Call table.

(c) A short burst of dial tone is returned to the user, and the user goes on-hook, or continues with the call.

Note: If the number dialed exceeds the remaining allowable digit capacity of the table (total 56 digits), no dial tone is heard and no trunk digits are stored.

4.13 Dial tone may not be returned after the foregoing procedure because a pause of longer duration than the interdigit time-out (10 s) before the * digit, causes the * digit to be ignored. The call will progress as usual and the number is not stored in the table.

4.14 To use the number stored as a number redial in the table, the user follows the procedures outlined in 6.06.

4.15 A saved number will be deleted when a new saved number is introduced (i.e., * is pressed within 10 seconds of dialing digits).

5. DISPLAY OF SPEED CALL NUMBERS

5.01 The Supervisor may display any Speed Call number on the console, provided that access is allowed to that number. The Supervisor is not allowed to display:

- Personal table numbers
- Confidential numbers, if System Option 289 is not set.

5.02 The procedure for displaying a number is as follows:

- Dial Speed Call access code
- Dial #
- Dial Speed Call entry access number
- Dial #.

5.03 The Speed Call access number appears in the console SOURCE display, with the first eight digits of the Speed Call number appearing in the DESTINATION display. Keying of the # or any other keypad digit causes the DESTINATION display to scroll left by one digit, and the ninth digit of the number to appear in the right-most position. Repeated operation of any keypad digit causes the display to successively scroll left, until the last digit of the number appears in the right-most position of the DESTINATION display. Scrolling will not continue beyond this point.

5.04 The display procedure shown in Figure 5-1 applies to a table which has a Speed Call access number 70, and a Speed Call number defined as 9*3035551212. The Speed Call access code has been programmed as 78 in the example. The console RELEASE Key is pressed to clear the display.

5.05 If the Supervisor can display confidential Speed Call numbers (i.e., System Option 289 is enabled), then when such a number is displayed the last two digits in the SOURCE display will be "L4". Figure 5-1 illustrates this attribute.

6. SPEED CALL USAGE

General

6.01 The stations use the same procedure as the Supervisor to call numbers. This procedure is:

- Dial Speed Call access code.
- Dial Speed Call entry access number.
- Dial manual digits, if required (4.05). The system starts dialing whenever the required number of digits is entered. Digits in excess of the required number are ignored. If the number of digits dialed are less than that specified, a "#" terminating digit must be used.

DISPLAYED DIGITS

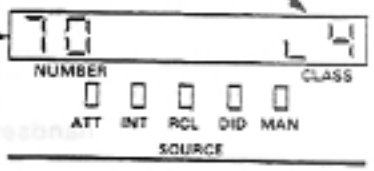
CONFIDENTIAL ATTRIBUTE

OPERATION

THE FOLLOWING SEQUENCE IS DIALED:

1. DIAL 78
2. DIAL #
3. DIAL 70
4. DIAL # (OR ANY OTHER KEY PAD DIGIT)

ENTRY ACCESS NUMBER



RESULT

THE CONSOLE SOURCE AND DESTINATION DISPLAYS SHOW THE DIALED DIGITS AT RIGHT.

DEFINED SPEED CALL NUMBER

OPERATION

5. DIAL # (OR ANY OTHER KEY PAD DIGIT)

RESULT

DESTINATION DISPLAY SCROLLS LEFT AND REVEALS NEXT DIGIT OF NUMBER.

OPERATION

6. REPEATED KEY PAD DIGIT OPERATION

RESULT

DESTINATION DISPLAY SCROLLS LEFT FOR EACH KEYPAD DIGIT OPERATION BY ONE DIGIT, UNTIL COMPLETE NUMBER HAS BEEN REVEALED.

NOTE: WHEN LAST DIGIT IS DISPLAYED THE DISPLAY WILL NO LONGER SCROLL, IRRESPECTIVE OF THE NUMBER OF KEYPAD DIGIT OPERATIONS.

X5406

Figure 5-1 Speed Call Number Display Example

6.02 The above entry results in one of the following actions:

Dialing of the Speed Call number (6.05 and Table 6-1).

- Busy tone is returned if a free trunk cannot be obtained.
- Reorder tone is returned because of one of the reasons stated in 6.04.

6.03 If neither busy nor reorder tone is heard by the caller, the call proceeds in the usual manner. If the caller hears busy tone, the handset should be replaced and the call attempted at a later time.

6.04 Reorder tone is heard by the caller after dialing the Speed Call access number, if one of the following conditions exist:

(a) The station does not have the required Class of Service for the dialed number to access the common-use table.

(b) The number dialed is not valid for a personal table assigned to the station, and if considered as a common-use table access number, the number is already assigned to another station's personal table.

(c) The common-use table is not available in the current configuration.

(d) The Speed Call feature is not enabled.

(e) The call is denied by Toll Control parameters in the case of the personal table user (or intercepted to the Supervisor if System Option 136 is enabled).

(f) The first digit(s) of the entry accessed is not a valid Trunk Group access code.

6.05 The sequence of events which takes place when a Speed Call number is used is shown in Table 6-1, and assumes that the proper access numbers have been used.

Saved Number Redial

6.06 The number redial procedure is applicable only to personal table users (stations), and only if the number redial attribute has been programmed and if the extension is a DTMF telephone set. The number to be used was entered as outlined in 4.10. The procedure to use the number is as follows:

(a) Lift handset and listen for dial tone.

(b) Dial Speed Call feature access code.

(c) Dial entry access number (of the number redial entry).

TABLE 6-1
SPEED CALL NUMBER OUTPULSING

Step	Event	Remarks
1	Caller dials Speed Call access code, followed by Speed Call entry access number, and manually dialed digits (if required)	Manually dialed digits are inserted immediately after dialing the Speed Call entry access number. When outpulsed (Step 4) they are automatically inserted in the correct place within the Speed Call number.
2	The first digit(s) of the number locate the trunk group	If all trunks are busy, including any in an authorized overflow group, then busy tone is returned to the caller. No camp-on or call-back facility applies to this application.
3	A free trunk is seized (Note 1)	An automatic "Wait for Dial Tone" condition occurs. This occurs regardless of whether a "*2" (see 4.04) had been included in the speed call number or not. If System Option 160 (limited wait for dial tone) had been enabled, then the number will be outpulsed after the time-out period.
4	Speed Call number digits are outpulsed on the trunk (Note 1)	Outpulsed digits are subject to the trunk group programming (e.g., rotary dial or DTMF digits may be programmed). When DTMF to RD conversion is used, the * digit cannot be used as a manually dialed digit. During outpulsing the caller is split from the outgoing call.
5	An audio connection is completed between calling party and trunk circuit	When called party answers, the call proceeds in the normal manner.

Note:
1. When the Supervisor is outpulsing an entry, all *2 special sequences are treated as *1.

6.07 If it is required to delete a saved number for any reason, perform the following procedure:

(a) Lift handset and listen for dial tone.

(b) Dial Speed Call feature access code.

(c) Dial "0".

(d) Dial the saved number entry access number.

(e) Go on-hook.

Toll Restriction/Toll Control

6.08 If the System was programmed to include Toll Control or Toll Restriction features, it should be noted that numbers entered in personal tables are subject to toll restriction or control, but those for common-use tables do not have this restriction or control.

7. EXTERNAL CALL FORWARDING

General

7.01 An extension with Speed Call capability (common-use or personal) may have calls forwarded to an external number. This allows an extension user to receive calls at home during "off business hours".

Operation

7.02 The Supervisor may set up External Call Forwarding (ECF) as per Table 7-1. Note the following tables assume the use of * as the Supervisor Function code (Feature Number 18). The extension may set up ECF as per Table 7-2. The Supervisor may check for ECF as per Table 7-3. The Supervisor may cancel individual ECF as per Table 7-4 or all ECF in the system as per Table 7-5. The extension to have its calls forwarded may cancel its ECF as per Table 7-6.

Programming

7.03 The ECF feature requires the minimum amount of System programming. System Option 273 (External Call Forwarding Enable) must be enabled. The extension being forwarded must have Speed Call capability Personal or Common-Use (paragraphs 2.05 - 2.21). The extension or trunk that will be forwarded as an ECF (after reaching an extension with ECF in effect) must have Class of Service Option 97 in its COS. Note that it is not possible to have normal digits inserted in an ECF (i.e., *3QQ).

TABLE 7-1
SUPERVISOR SET-UP OF ECF

Step	Action	Remarks
1	Dial *11nnn	Where *11 is the attendant function code and nnn is the extension number to have its calls forwarded
2	Dial an assigned Call Forwarding Code a-d	a - Call Forwarding - Busy b - Call Forwarding - Don't Answer c - Call Forwarding - Follow Me d - Call Forwarding - Busy/Don't Answer
3	Dial Speed Call access code	
4	a) If a personal table is to be used, dial the Speed Call entry access number supplied by the extension. b) If a common-use table is to be used and a number assigned, complete Steps 2-5 of Table 4-2. c) If a common-use table is to be used "as is", dial Speed Call entry access number.	

TABLE 7-2
EXTENSION SET-UP OF ECF

Step	Action	Remarks
1	Lift handset	Listen for dial tone
2	Dial an assigned Call Forwarding Code a-d	a - Call Forwarding - Busy b - Call Forwarding - Don't Answer c - Call Forwarding - Follow Me d - Call Forwarding - Busy/Don't Answer
3	a) Dial Speed Call access code. Complete Steps 3-6 of Table 4-1. b) Dial Speed Call access code, dial Speed Call entry access number, then go on-hook.	

TABLE 7-3
SUPERVISOR CHECK FOR ECF

Step	Action	Remarks
1	Dial *11nnn	Where *11 is the Supervisor function code and nnn is extension number to be checked
2	Check extension as per Figure 7-1	
3	Press RELEASE Key	

TABLE 7-4
TO CANCEL ECF FOR AN EXTENSION FROM THE CONSOLE

Step	Action	Remarks
1	Dial, *11, nnn, #	Where nnn is the extension numbers
2	Press RELEASE Key	

TABLE 7-5
TO CANCEL ALL ECF FROM THE CONSOLE

Step	Action	Remarks
1	Dial, * 1 #	
2	Press RELEASE Key	All system Call Forwarding is now canceled

TABLE 7-6
TO CANCEL ECF FROM AN EXTENSION

Step	Action	Remarks
1	Lift handset	Listen for dial tone
2	Dial Call Forwarding feature access code	
3	Return handset to on-hook position	Call Forwarding cancelled

SX-100®/SX-200®

SUPERSWITCH®

AUTOMATIC CALL DISTRIBUTION SYSTEM

AUTOMATIC CALL DISTRIBUTION DESCRIPTION

GENERIC ACD

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1. INTRODUCTION

General

1.01 The SX-100/SX-200 ACD System is a method of telephone switching operation, whereby a large volume of incoming trunk traffic is concentrated on one or more groups of extensions (Agents) within the system. The calls are all of a similar nature, and the Agents are trained/equipped to provide the particular information or service the caller is requesting. The System can provide various recordings, that provide information as to call progress when a caller does not access an Agent immediately. These recordings can be supplied at predetermined intervals or the System can determine the appropriate intervals based on traffic and time to answer. The System also chooses the Agent to service the call (if programmed to have a choice) such that all Agents are given an equal workload. A supervisor normally oversees the operation, while monitoring the activity of the Agents, and coping with unusual situations which may arise.

Reason for Issue

1.02 This Section has been issued to provide a description of the Automatic Call Distribution feature of the SX-100/SX-200 ACD System.

2. ACD GENERAL FEATURE OPERATION

Part Description

2.01 This Part provides: a General Description, a Block Diagram and a brief Feature Description of each of the ACD System components:

- Agent Groups
- Agents
- Supervisor
- Recorded Announcements
- Performance Information-Agents and System
- Incoming Trunks.

General Description

2.02 As previously described the SX-100/SX-200 ACD System provides a method of concentrating a number of incoming trunks on to one or more Agent Groups or to Recording Groups. The method of concentration may be programmed as automatic, or the concentration may vary as traffic conditions, Supervisor programming and Agent availability vary. At all times a Supervisor may control the ACD feature to provide maximum System flexibility. Throughout this Part, Figure 2-1 should be consulted for a general overview of the operation of the ACD feature.

Agent Groups

2.03 All extensions that handle the incoming ACD traffic are grouped into Agent Groups. The Agent Groups have the following features:

- Up to 12 Agent Groups available. The total collective assignment of Recording Groups, Hunt Groups and Agent Groups can not exceed 12.
- Agent Groups are programmed during Standard Programming and are similar to Hunt Groups when programmed.

Agents

2.04 Extensions that are programmed in Agent Groups during Standard Programming are referred to as Agents. Agents 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.
- 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.

SS4 Agents

- Agents can signal the supervisor when help is required with or without the caller being aware.
- Agents can use a SUPERSET 4™ 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.

Supervisor

2.05 The Supervisor position may be either or both attendant consoles (if two Supervisors are required). The Supervisor provides various functions such as:

- Monitoring the Mean Time to Answer (MTTA), the Mean Abort Time (MAT), the number of active Agents and the number of calls waiting for all Agent Groups.

- Being aware instantly when the MTTA exceeds a preset maximum for an Agent Group.

- Monitoring an Agent's conversation without any audio intrusion by using the FLASH button programmed as the MONITOR button. It should be noted that since this form of override provides no form of intrusion tone, and the caller will not be aware that additional persons are monitoring the conversation, local authorities should be consulted for legalities before enabling this button.

- Recorded messages (maximum 8 seconds per message, without linking) using the MITEL Recorded Announcement Card (RAC). This card allows the Supervisor to make a digital non-volatile recording. The recording process is not affected by concisely spoken language or accent. The card is not subject to routine maintenance or tape breakage and may be preferable to most commercial tape recording units.

- Programming the recording length of the announcement of the Recorded Announcement Device (RAD and RAC). This allows the System to know when the recorded message has reached the end. This also allows the recording to return to the beginning of the message so that the next caller receives all the message.

Recorded Announcements

2.06 The SX-100/SX-200 ACD System supports two different recording units: the RAC and RAD. These devices provide the following characteristics:

- Recorded Announcement Card (RAC). This card occupies one peripheral slot in the system and provides two different 8 second recordings using digital solid-state storage. Messages are recorded from the Supervisor's position and two messages may be added for a total of 16 seconds.

- Recorded Announcement Devices (RADs). These customer-provided devices connect to the system using a standard tip-ring pair of a regular line circuit.

- Intervals between recording playbacks for each Agent Group's trunks can be specified, or can be selected to be automatically determined according to the current MTTA.

- A number of RACs and RADs used are limited only by the peripheral slots available in any particular configuration.

- 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.

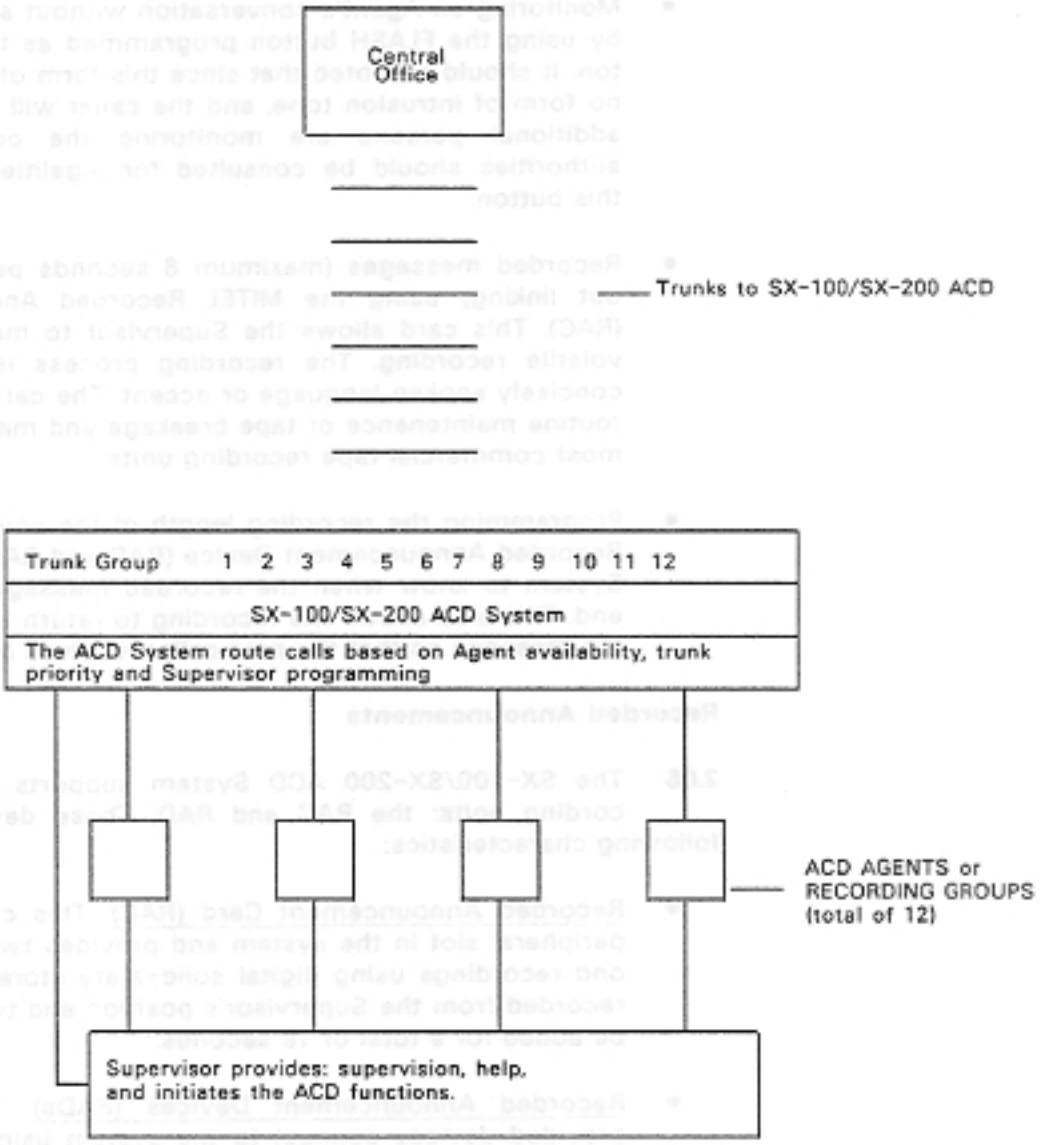

Figure 2-1 ACD Block Diagram

- Trunks in Trunk Group 12 are given priority when ringing the System. This allows the System to be programmed such that specific trunks have priority in being connected to Agent Groups or Recording Groups.

Performance Information

2.07 The SX-100/SX-200 ACD Systems may be programmed to provide printed information (through the RS-232 Port) that includes the following features:

- Automatic print of shift summary when an Agent logs off. The summary provides: shift start time, shift duration, number of calls answered, and total duration of all calls handled.

- Supervisor can request a print providing the number of calls answered, the number of calls routed away from the Agent Group (to another Agent Group, extension etc.), and the number of calls aborted (given up by the incoming caller before serviced by an Agent) for every Agent Group.

- Account code usage by the Agents can easily record valuable data (in the standard SMDR record) retrieved from the calls handled. If other print information is required the MITEL Data Demultiplexer is recommended (See Section MITL9160-080-300-NA).

Incoming Trunks

2.08 The incoming trunks may be treated in a manner that allows for more efficient handling by utilizing the following features:

- Automatic two-level priority selection - while waiting for service from an Agent Group, a trunk residing in Trunk Group number 12 will have priority over all others.

- If the MTTA exceeds a selected maximum for an Agent Group, all incoming trunks can be diverted to an overflow route - special Recording/Agent Group, or extension/supervisor automatically. The System will return to normal routing as soon as the overflow conditions return to normal.

3. TYPICAL OPERATION

Description

3.01 This Part provides an application of the SX-100/SX-200 ACD System and a brief explanation of how the System processes the incoming calls.

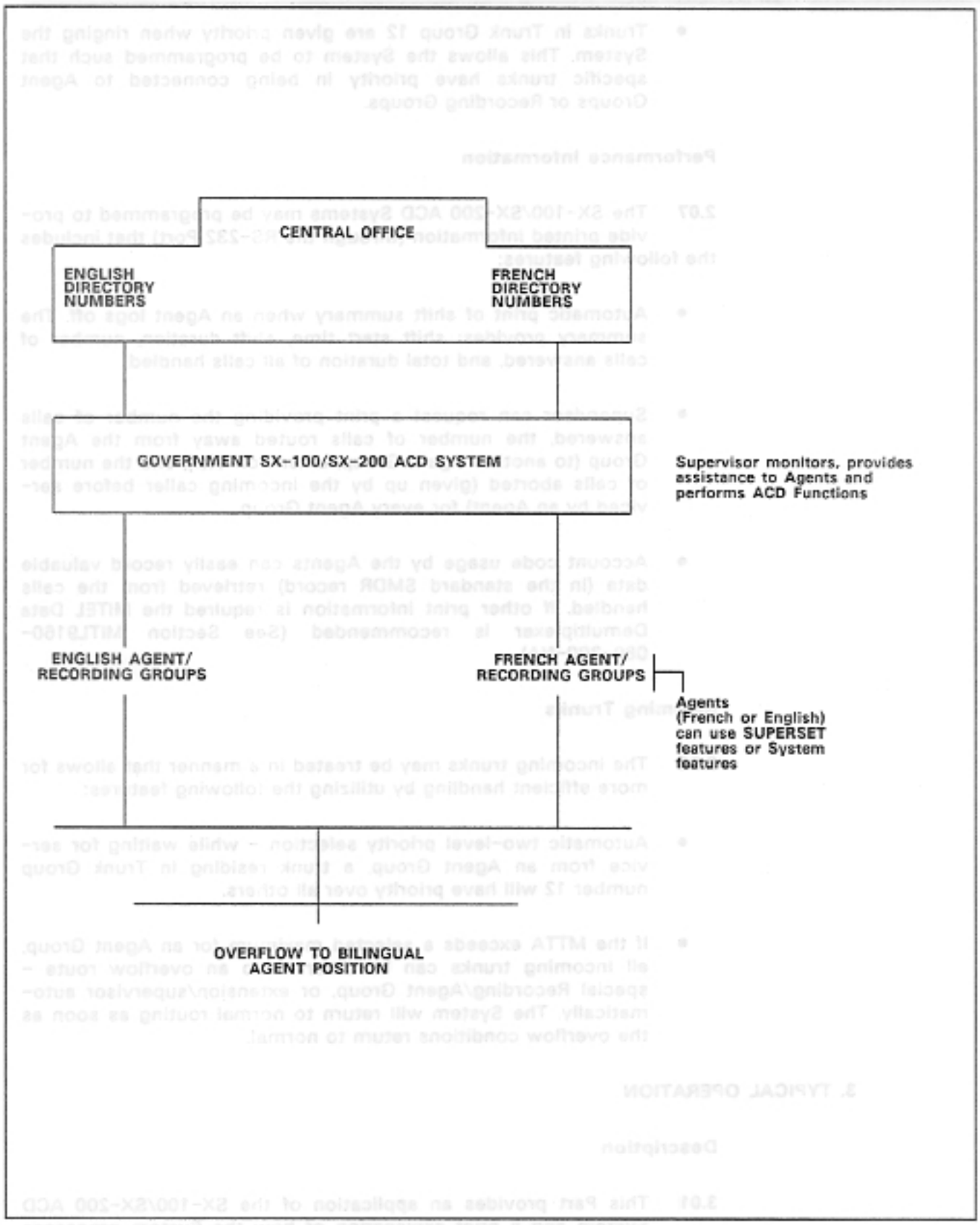

Figure 3-1 ACD Government Application

An Application

3.02 An application of the SX-100/SX-200 ACD System might consist of a government agency supplying bilingual tax information (Figure 3-1).

Directory Numbers

3.03 In this application specific directory numbers are published as either English or French. The ACD System has been programmed to route English trunks to English Agent or Recording Groups, and the French trunks to French Agents or Recording Groups.

Agent/Agent Groups

3.04 If all the Agents in an Agent Group are occupied the incoming trunk call will be routed to a Recording Group of the appropriate language. If the incoming call is not of the correct language the Agent may transfer the call to the correct Agent Group by using the Call Transfer Feature. (Note: Only the information up to the time of the transfer will be retained by the System. All further information will not be recorded.) If the call is of a specific variety that requires Supervisory assistance, the Agent, if equipped with a SUPERSET 4, need only press the HELP Key on the SUPERSET. In addition the Agent equipped with a SUPERSET 4 is free at any time to enter an Account Code (that may be verifiable), so as to keep a log of time spent on specific questions. An Agent may transfer a call to another Agent Group but that call will act as a Camp-On, that is, it will not access any more Agent/Recording Groups.

Supervisor

3.05 The Supervisor can monitor the progress of the Agent Groups by the use of Supervisor Functions (described in Part 4 of this Section). For Agents equipped with SUPERSET 4s, a special signal can be received at the console indicating that a particular SUPERSET 4 Agent is in need of assistance. The Supervisor may also monitor calls in progress if the FLASH button on the console has been programmed as a MONITOR button. When this button is used, no form of intrusion tone is generated to the parties being monitored. If desired, regular override may be used.

4. ACD PROGRAMMING AND ASSIGNMENTS

Enabling ACD

4.01 ACD is enabled automatically when the SX-100/SX-200 ACD is powered up. The System still requires that Standard and Extended Programming be performed. It is important to note that for utmost flexibility the Supervisor Function Codes determine a substantial portion of the ACD operation.

Standard Programming

4.02 During Standard Programming certain Features and Options must be enabled:

- All relevant SMDR features must be enabled (see Section MITL 9105/9110-090-451-NA).
- Feature Access Code number 49 (ACD Agent Access Code) must have an Access Code defined in order that the Agents be able to log in and out.
- Feature Access Code number 18 (Attendant Function Code) must be programmed (usually ⁎).
- 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 button converted to an OVERRIDE button. System Option 103 (Attendant Busy Override) must also be enabled. Note that System Option 131 conflicts with 121 (Serial Call Override Flash Button).
- Enable the printer options applicable to the printer in use. Also enable the printer control enable options, if desired. If the printer is disabled (⁎14⁎) and an Agent logs out, a minor alarm is raised at the console. The format is:

  - SOURCE E098
  - DEST Prntr.

- Enable the relevant Traffic Measurement System Options (refer to Section MITL9105/9110-090-450-NA).
- The Data Demultiplexer can be used to separate SMDR and traffic/agent print-outs (refer to Section MITL9160-080-300-NA).
- A RAD may only be connected to a standard line card Data Blocks.
- 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.

Data Blocks

4.03 Data Block Number 1 holds RAC and RAD definitions. Data Block Number 5 retains 30 Agents shift data.

Agent Class of Service

4.04 Each Agent must have certain Options enabled in their Class of Service:

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

Agent Groups

4.05 Agents must be programmed as being in an Agent Group. The Agents in the Agent Group must service all the same type of calls. Agent Groups are assigned Access Codes that will define the type of service provided, to the Supervisor and ultimately to the outside world.

Supervisor Functions

4.06 The remainder of this Part deals with the Supervisor Functions required to specify the ACD parameters. The Supervisor specifies all parameters by dialing from the Attendant Console using Supervisor Function Codes. All Standard Programming must be completed before attempting to utilize the Supervisor Function Codes.

MTTA per Agent Group

4.07 To specify the maximum MTTA for each Agent Group, and at the same time the overflow destination for all incoming calls when the MTTA exceeds this maximum:

- Dial *246
- Dial Agent Group Access Code
- Dial maximum time to answer, in seconds (0-255)
- Dial Overflow Access Code (Agent/Recording Group, Supervisor)
- Dial * to enter another Agent Group number or press the RELEASE button.
- The console displays:
  SOURCE XXXX TTT
  DEST YYYY
  where: XXXX - Agent Group Access Code
  TTT - maximum time to answer (MTTA 0-255 s)
  YYYY - Overflow Access Code (Agent Group, Recording Group, station, or Supervisor)

4.08 To display the current maximum time to answer and overflow code:

- Dial *246
- Dial Agent Group Access Code
- Dial #

- Press the RELEASE button to terminate display.
- The console displays:
  SOURCE XXXX TTT DEST YYYY
  where: XXXX – Agent Group Access Code
  TTT – maximum time to answer (MTTA 0–255 s)
  YYYY – Overflow Access Code (Agent Group, Recording Group, extension, or Supervisor)

4.09 To specify the after-call work time applicable to all Agents in each Agent Group.

- Dial ⁎245
- Dial Agent Group Access Code
- Dial work time, in 2-digit seconds (0–99)
- Dial ⁎ to enter another Agent Group number or
- Press the RELEASE button when finished.
- The console displays:
  SOURCE XXXX TT
  where XXXX – Agent Group Access Code
  TT – current work time (0–99 s)

Recorded Announcements

4.10 The Supervisor defines the equipment numbers which contain either RACs or RADs. When defining a RAC, two equipment numbers must be defined – one for each message. These equipment numbers will be the second and sixth equipment numbers of the slot the card is in. When defining a RAD, the equipment number of the line circuit the RAD is connected to, must be specified.

To program a RAD:	**To program a RAC:**
Dial ⁎230 or	Dial ⁎231
Dial the RAD equipment number	Dial the RAC equipment number
Dial ⁎ to proceed to the next equipment	Dial ⁎ to proceed to the next equipment
Press the RELEASE button	Press the RELEASE button
To delete a RAD:	**To delete a RAC:**
Dial ⁎230 or	Dial ⁎231
Dial the RAD equipment number	Dial the RAC equipment number
Dial #	Dial #
Press the RELEASE button	Press the RELEASE button

To review all defined RADs/RACs:

- Dial *232* – the first RAD/RAC equipment number programmed will appear in the SOURCE display in the left corner and a 0 in the right corner to indicate a RAD or 1 in the right corner to indicate a RAC.
- Dial * to advance to next RAD/RAC or press the RELEASE button to terminate.

To record a message on the RAC:

- Dial *240
- Dial RAC equipment number
- Dial *
- Supervisor waits until a 50 ms 'beep' is heard
- Supervisor speaks message (up to 8 seconds in duration) into handset.
- Press the RELEASE button when finished.

To playback a message from a RAC:

- Dial *241
- Dial RAC equipment number
- Dial *
- Message will be heard with handset, otherwise busy tone will be heard if the recording is currently in use.
- Press the RELEASE button to terminate.

To specify the length of the message:

- Dial *242
- Dial the Recording Group Access Code
- Dial the recording duration, in 2-digit seconds
- The SOURCE display shows:
  XXXX TT
  where XXXX – Recording Group Access Code
  TT – recording duration (0–99 s)

To specify the recordings and delay times for an Agent Group:

- 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 (0–99 where 0 = automatic)
- Dial * to enter another choice number or
- Press the RELEASE button
- 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 (0-99 s)

To review recording assignments:

- Dial *244
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial * to review another recording assignment or
- Press the RELEASE button 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 (0-99 s)

To delete all data associated with an Agent Group (maximum MTTA, overflow specification, Recording Group, and delay time assignments):

- Dial *243
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button to terminate.

To define which Recording Group a DID Intercept will be routed to:

- Dial *233
- Dial Recording Group Access Code
- Press the RELEASE button to terminate.

To delete DID intercept routing:

- Dial *233
- Dial #
- Press the RELEASE button to terminate.

To define which Recording Group an Automatic Wake-Up will be routed to:

- Dial *234
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete which Recording Group an Automatic Wake-Up will be routed to:

- Dial *234
- Dial #

- Press the RELEASE button to terminate.

To examine the current status of an Agent Group:

- Dial *247
- Dial Agent Group Access Code
- Press the RELEASE button 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 (0–255 s based on last 4 calls answered)
  AAA – Mean Abort Time
  (0–255 s based on last 4 calls aborted)
  The Calls Waiting display will show the number of calls waiting (maximum 9).

Recorded Announcement Notes

4.11 The following notes should be considered when programming or using recorded announcements:

- If a RAD does not answer a call within a specified period of time the call will be camped-on to the Agent Group and the RAC will be locked out and raise a lockout alarm at the console. When the RAD is repaired the Supervisor must cancel the lock-out condition at the console.

- Messages on RADs are always recorded off-line, as per the manufacturer's specifications.

- All recording units holding the same message must be put into a Recording Group during Standard Programming.

- The Access Code of each Recording Group assigned during Standard Programming is used to reference the Recording Group during Supervisor Functions.

- Each RAC has two messages per card, and it has two channels able to access each message. Therefore, when defining a RAC Recording Group, both the primary equipment number of the message (the second or sixth equipment of the card) and the secondary equipment number of the same message (fourth or eighth respectively) must be placed in the Recording Group. Failing to do this will result in only a 50% utilization of the cards playback capabilities.

- The length of the messages on the devices in each Recording Group must be specified.

- The duration of the message (programmed by the Supervisor) is used to disconnect the caller from the recording device and

return the caller to Music on Hold (MOH). For RAD Recording Groups, the duration of messages can vary widely. For RAC Recording Groups, the duration will always be 8 s or less.

- The console is used to link the Recording Groups to the Agent Groups. For each Agent Group, up to four different recordings can be given to an unserviced trunk calling that Agent Group. Each recording 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, from the time the System answered it (in the case of the first recording) or from the time it was disconnected from the last message (in the case of the last three recordings), until the time it is eligible to hear the recording that the delay time is associated with. A time delay must be given for the first recording. The time delay is optional for the last three Recording Groups. If the Recording Delay is unspecified, the system will determine a single delay time for the remaining recordings, such that they are equally-spaced, and are all heard, given the current MTTA.

5. ACD DETAILED OPERATION

Agents

5.01 Each Agent is assigned an ID code (by the Supervisor), ranging from 01 to 63. This ID code is used when the Agent logs on and off. The Agent log ability uses the following format:

- Go off-hook at the Agent position
- Dial ACD Agent Access Code
- Dial Agent ID code
- Go on-hook.

To log off, the Agent performs the following:

- Go off-hook at the Agent position
- Dial ACD Agent Access Code
- Dial 00
- Go on-hook.

5.02 If more than 30 Agents attempt to log on, the 31st will receive NO ACCESS tone or if a SUPERSET 4 user, NO ACCESS will appear in the display. At the end of every call handled, a specified work time is given to the Agent. The Agent cannot abort this work time, and cannot extend it. If more idle time is required, the Agent can use Do Not Disturb to prevent calls being routed to that position. Agents using a SUPERSET 4 may enter an Account Code while talking on a trunk. An Account Code entered by an Agent will overwrite any existing code. If the Agent (using a SUPERSET 4) enters a new code that overwrites an old code while talking on a trunk, all the information is charged to the new code. Also when using a SUPERSET 4, an Agent, if talking or off-hook, will have the HELP prompt active. If the Agent presses this key, a minor alarm is sent to the Supervisor. The alarm contains the

extension number and equipment number of the Agent requiring assistance and a help display.

Agent Groups

5.03 Agent Groups are normally defined during Standard Programming by the System programmer. Each group may contain any number of Agents and be subject to four Recording Groups and one default recording.

Supervisor Functions

5.04 The Supervisor can examine, delete, or change parameters of the System as outlined in Part 4 of this Section. Perhaps the most important feature of the Supervisor is the ability to examine the current status of an Agent Group by:

- Dialing *247
- Dialing Agent Group Access Code
- 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 (0–255 s based on last 4 calls answered)
  AAA – Mean Abort Time (0–255 s based on last 4 calls aborted).

5.05 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
  XXXX or
  where NNN is the Agent Group number (1–12)
  XXXX is the Agent Group Access Code.

5.06 The Supervisor can then add more agents to the group, or simply let the programmed overflow mechanism operate. If the overflow route is a Recording Group, the incoming trunk will be dropped immediately after the recording is heard by the caller. When the MTTA goes below the maximum, normal message playbacks will occur. If an Agent requires assistance from the Supervisor and presses the HELP Key on the SUPERSET, a minor alarm is generated:

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

Override/Monitor

5.07 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 button. While this button 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. 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 button that the programmer substituted for the FLASH button. While this button 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.

Performance Data

5.08 When an Agent logs off from an Agent position, a summary of the Agents shift will be printed. The shift record will be of the form:

DATE	GROUP	Agent	EXTN	LOGIN	SHIFT	CALLS	MINS
03/83	114	63	1234	09:00P	07:58	0123	0234

where the LOGIN time and SHIFT length are in hours:minutes, CALLS is the total number of calls handled, and the MINS is the total time on calls in minutes. The system Agent capacity (normally 30) will be decreased by 1 for every Agent that has logged off, but whose shift record has not yet printed. (It is similar to SMDR and trunks - if all SMDR buffers are in use, a trunk will not be released until the printer has printed its buffer.)

5.09 The Supervisor can also obtain system-wide Agent Group data. This can be obtained from the Traffic Measurement report, which has an ACD supplement (refer to Section MITL9105/9110-090-450-NA). Traffic Measurement can be printed at any time of the day by using a console Traffic Measurement function, at one specified time, or it can be automatically dumped every hour. At each print, the traffic data is based on the last hour's activity only. The ACD shift print-out has been organized to be printed with the traffic measurement data. After all traffic data has been printed, a list of all the activity on programmed Agent Groups will follow. The Agent Group data will have the form:

GROUP	CALLS ANSWERED	CALLS ABORTED	CALLS OVERFLOWED
1234	0274	0012	0010
5678	0302	0018	0013

5.10 Once this group data is printed, the calls answered and calls aborted counts are cleared. Unlike traffic measurement, the ACD data is always accumulated since the last print and not the last hour. Following the group data, a list of all the active Agents will be printed in the same format as the log-off print.

Recorded Announcements

5.11 When a recording is required for an incoming trunk the specified Recording Group is scanned, and any idle recording device is activated. In the case of a RAD, the equipment number is rung as a telephone set would be rung, and the System waits for the device connected to the equipment number to answer. Upon answer, the device equipment number is connected to the incoming trunk, and the recording duration is timed. At the end of the programmed duration, the system disconnects the trunk from the device port, and waits for the recording device to go back on-hook. If a trunk is listening to a recording while an Agent becomes free, the trunk will immediately be taken from the recording and the Agent rung for the trunk.

Incoming Trunks

5.12 The routing for incoming trunks will follow the rules discussed in Part 4. In the case of an overflow, the Mean Abort Time is adjusted for the call. It must also be noted that for proper operation of an ACD facility, the trunks must be able to initiate a release. Otherwise, the system cannot recognize abandoned calls, which will remain queued (and eventually answered by agents), thereby placing an unnecessary load on the system.

6. SUPERVISOR FUNCTION FORMS

The following forms should be maintained by the Supervisor when changing the ACD Functions.

FORM ACD-1
TRUNK GROUP/AGENT GROUP ASSIGNMENT

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

LISTED DIRECTORY NUMBER	TRUNK EQPT. NUMBER	(✓) PRIORITY (Note 1)

Note:

1. Trunks in Trunk Group 12 have priority.

FORM ACD-2
AGENT/RECORDING GROUP INFORMATION

AGENT GROUP CODE	RECORDING ORDER	DELAY TIME (two digits)	OVERFLOW POSITION (Note 1)
	1		
	2		
	3		
	4		

AGENT GROUP CODE	CHOICE NUMBER	DELAY TIME (two digits)	OVERFLOW POSITION (Note 1)
	1		
	2		
	3		
	4		

AGENT GROUP CODE	CHOICE NUMBER	DELAY TIME (two digits)	OVERFLOW POSITION (Note 1)
	1		
	2		
	3		
	4		

Note:

1. The OVERFLOW POSITION may be: a Recording Group, an Agent Group, or the attendant.

FORM ACD-3
AGENT GROUP/TIME ASSIGNMENTS

AGENT GROUP ACCESS CODE	MEAN TIME TO ANSWER (0-256)	OVERFLOW ACCESS CODE	WORK TIME (00-99)

AGENT GROUP ACCESS CODE	MEAN TIME TO ANSWER (0-256)	OVERFLOW ACCESS CODE	WORK TIME (00-99)

AGENT GROUP ACCESS CODE	MEAN TIME TO ANSWER (0-256)	OVERFLOW ACCESS CODE	WORK TIME (00-99)

AGENT GROUP ACCESS CODE	MEAN TIME TO ANSWER (0-256)	OVERFLOW ACCESS CODE	WORK TIME (00-99)

AGENT GROUP ACCESS CODE	MEAN TIME TO ANSWER (0-256)	OVERFLOW ACCESS CODE	WORK TIME (00-99)

SX-100®/SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION SYSTEM
SUPERVISOR CONSOLE DESCRIPTION
GENERIC ACD

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1. GENERAL

1.01 This Section describes the supervisor and programming or maintenance functions of the latest version of the SX-100/SX-200 Supervisor Console. It contains a brief description of each button function, the displays and the facilities provided for the use of visually impaired supervisors. For a full description of all features provided by the SX-100/SX-200 Systems, refer to Section MITL9105/9110-090-105-NA.

Reason for Issue

1.02 This Section has been issued to provide information pertaining to the Generic ACD feature package.

Visually Impaired Operator's Console

1.03 For information on the visually impaired operator's console see Section MITL9105/9110-098-302-NA.

2. INTRODUCTION

General

2.01 The version of the Supervisor Console described in this Section incorporates certain additional features, to those features provided by earlier consoles. The console is electrically and physically compatible with any SX-100/SX-200. An illustration of this console is shown in Figure 2-1.

- 12-Button Dial Pad
- 30 Operating Buttons and LED's
- Ten Trunk Group Busy Indicators
- Three Alarm Indicators
- Calling and Called Number Displays
- Equipment Status Field
- Digital Clock
- Digital Date
- Call Waiting Display.

2.02 The following features are additional to those for the earlier version console:

- Audible discrimination of incoming calls, HOLD button time-out, Supervisor Conference Flash and Minor Alarm Flash (refer to 4.34).
- LAMP TEST button lockup.
- Audible keyboard polling (refer to 4.36).
- Expanded Equipment-Status Field capability for 200 equipments (lines or trunks) to be displayed.

Release Loop Operation

2.03 Release loop operation is used by the SX-100/SX-200 Systems. This method of operation allows the supervisor to camp-on (or connect) a call to a trunk or extension, and release from the call before the called number answers. If the released call is not answered within the selected recall time period, it is returned to the console as a recall.

3. PHYSICAL DESCRIPTION

General

3.01 The console consists of two major assemblies: an upper and a lower assembly. Each major assembly consists of the minor assemblies (see Figures 3-1(a) and 3-1(b)) described in the following paragraphs. The overall dimensions of the console housing are 349 mm (13.8 in.) wide, 236 mm (9.3 in.) deep and 173 mm (6.8 in.) high.

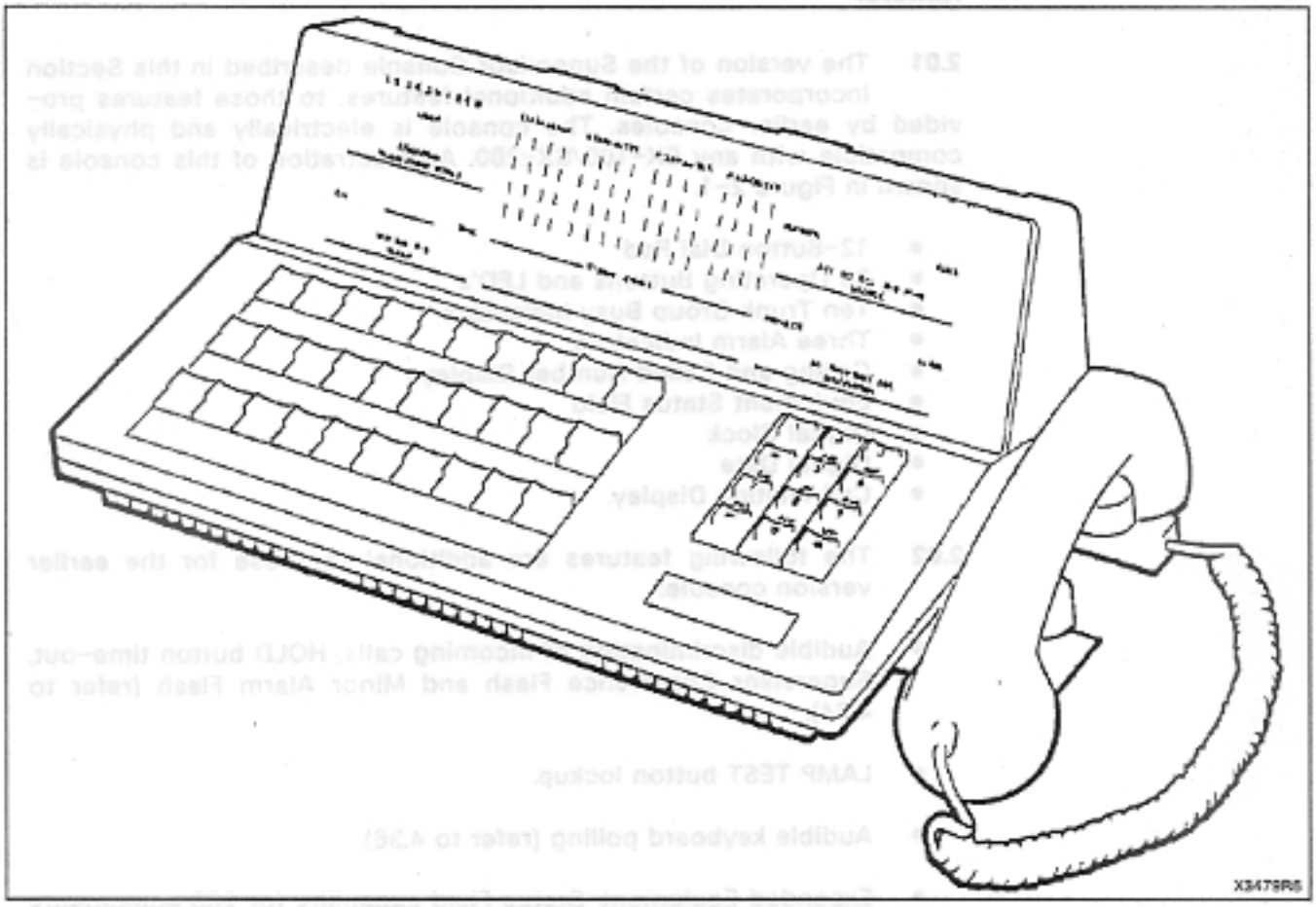


Figure 2-1 Supervisor Console Type 200

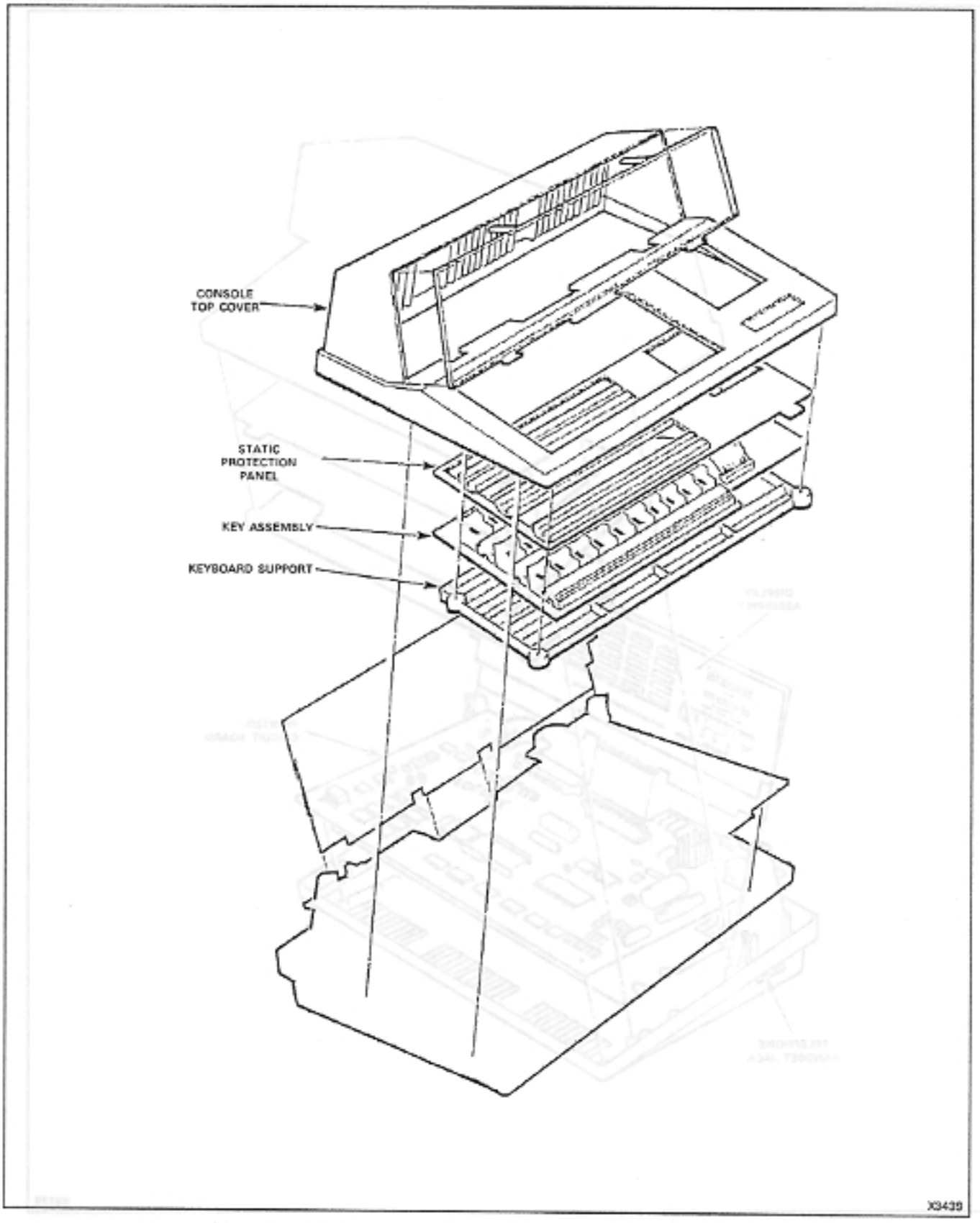


Figure 3-1(a) Supervisor Console Major Components

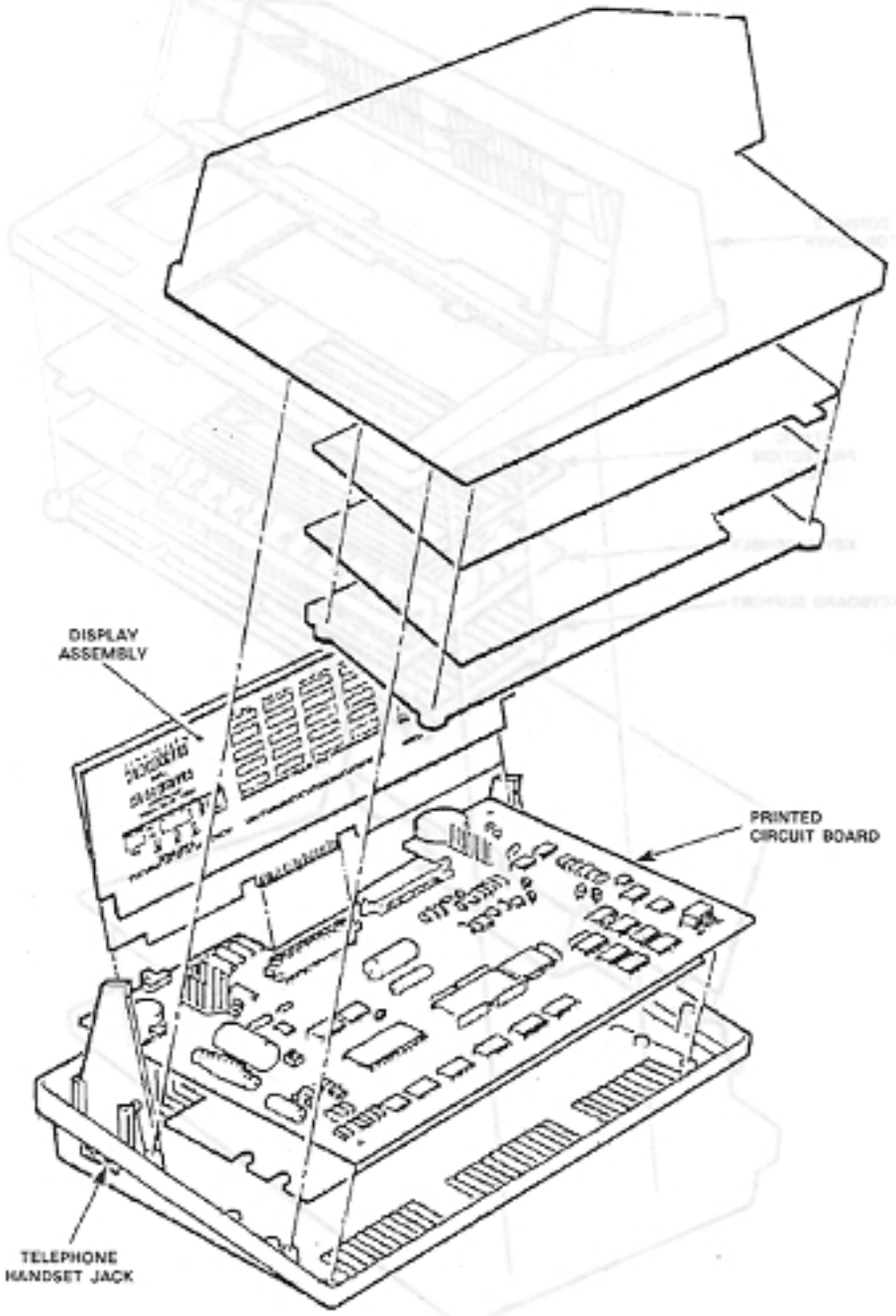


Figure 3-1(b) Supervisor Console Major Components

Upper Assembly (Figure 3-1(a))

3.02 The upper assembly consists of the following parts:

(a) **Keyboard PCA.** A PCB assembly with 30 buttons (each incorporating a LED), a DTMF dial pad and a cable harness, the free end of which plugs into the mother board assembly. See Figure 4-1(b) for the button layouts.

(b) **Keyboard Crate.** A molded plastic structure designed to physically support the keyboard PCA.

(c) **Housing Top.** The plastic moulded top of the console housing.

(d) **Top Shield.** An aluminum plate made to fit under the top cover, to provide a path to ground for static discharge.

(e) **Display Window.** A protective window for the display graphic panel. It is removable for the purpose of applying designations to the Busy Lamp Field.

(f) **Designation Strip Covers.** Three transparent covers for the key designation strips. They are removable for the purpose of changing the button designations. One cover is also provided for the console telephone number insert.

(g) **Keyboard Designation Strips.** Printed strips which are provided in three standard forms - Commercial, Hotel/ Motel and Maintenance - together with optional individual labels to allow a change in the standard button designations.

Lower Assembly (Figure 3-1(b))

3.03 The lower assembly consists of the following parts:

(a) **Motherboard PCA.** A PCB assembly which holds the main console circuits, power supply and processor. Connectors are provided into which the Display PCA, the Keyboard PCA, the speaker and handset jack leads are plugged. The PCB assembly also has the connector installed which extends the console circuits via the connectorized cable assembly to the System. The ringer volume control and cut-over switch are also mounted on the board, and are accessible from the rear of the housing.

(b) **Display Assembly.** A PCB assembly of LED arrays and 7-segment displays to which a laminated graphic artwork panel is attached. The Display Assembly holds the LEDs for the following individual displays (see Figure 4-1(a)):

- Trunk Group Status
- Calls Waiting
- Equipment Status Field

- Source
- Destination.

(c) **Housing Bottom.** The plastic moulded bottom of the console housing.

(d) **Housing Shield.** An aluminum plate made to fit in the housing bottom, which connects to the top shield and provides a path to ground for static discharge.

(e) **Harness Assembly.** Two pairs of handset jacks and a speaker are connected to the motherboard via a wiring harness. The phone jacks are mounted on the card guides which are channeled into the housing bottom. The speaker fits into channels in the back wall of the housing bottom.

4. FUNCTIONAL DESCRIPTION

General

4.01 The Supervisor Console faceplate layout shown in Figure 4-1(a) applies to the normal commercial type installation. The button designations change to meet the different requirements for a Hotel/Motel installation or when the console is used for programming and maintenance (Parts 5 and 6). The following description details the function of the buttons (shown in Figure 4-1(b)), the indicators, displays and audible tone signals.

Buttons and Indicators

4.02 Each functional button on the Supervisor Console has a Light Emitting Diode (LED) mounted and visible on the surface of the button. The function of each button is designated on the strip immediately under the button. The state of the LED indicates the condition of the button:

- Flashing LED – the system expects a response from the associated button.
- Lit LED – the associated button is presently active.
- Off LED – the feature is not active.

4.03 **LAMP TEST:** This button allows the supervisor to test all indicators, LEDs and displays on the console. Pressing the button causes all LEDs on the console to light and the console ringer to sound. If the button is then released and pressed again, all the LEDs go out, the ringer stops and all console displays show 8. This operation therefore allows the supervisor to verify that no faulty LED or display exists. The LAMP TEST button may be used by a visually impaired supervisor to determine the status of the remaining buttons. When the LAMP TEST button is depressed for more than 5 seconds, in either mode, the display will lock to that mode. A further depression of the LAMP TEST (or any other button) will cause the console to revert to

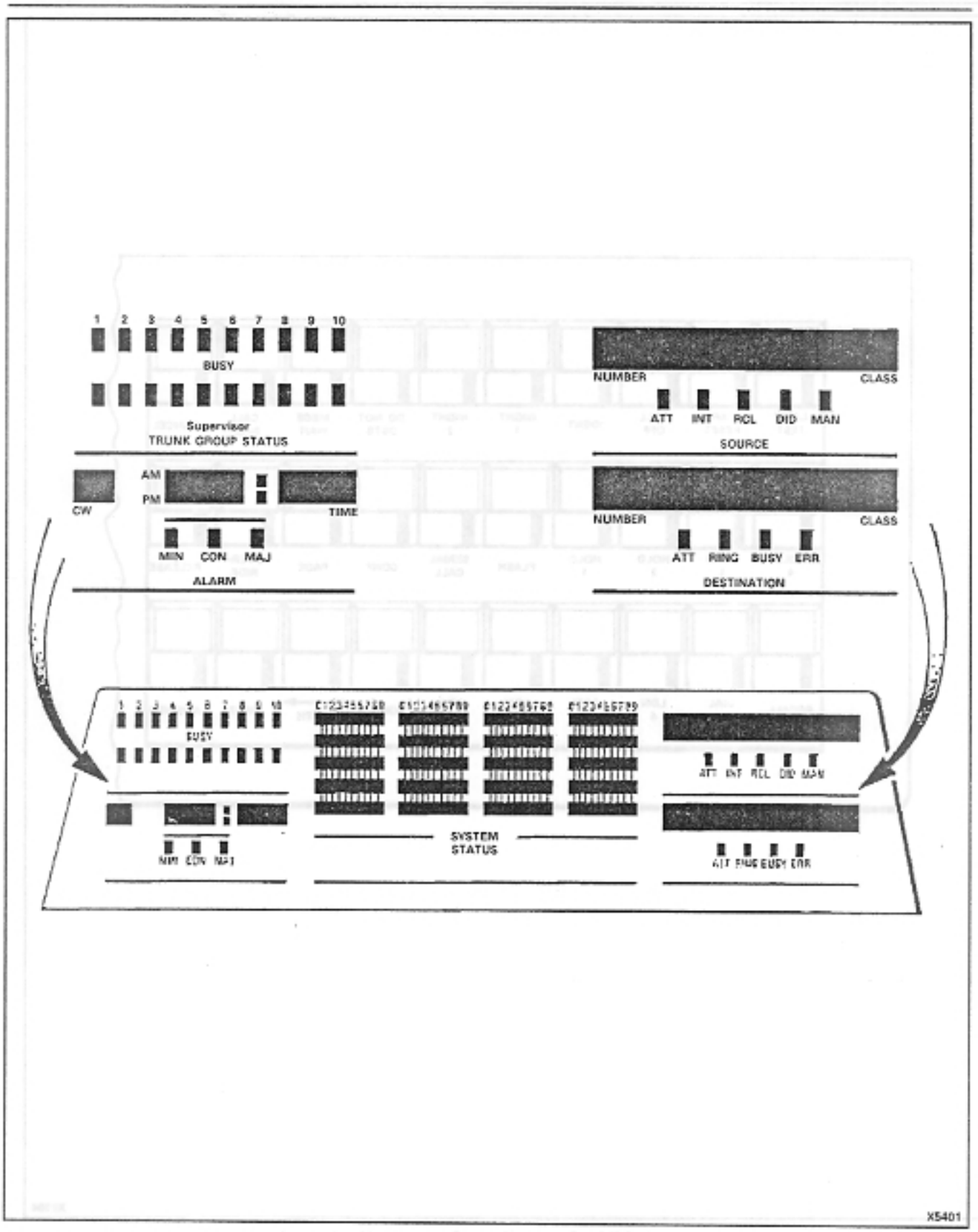
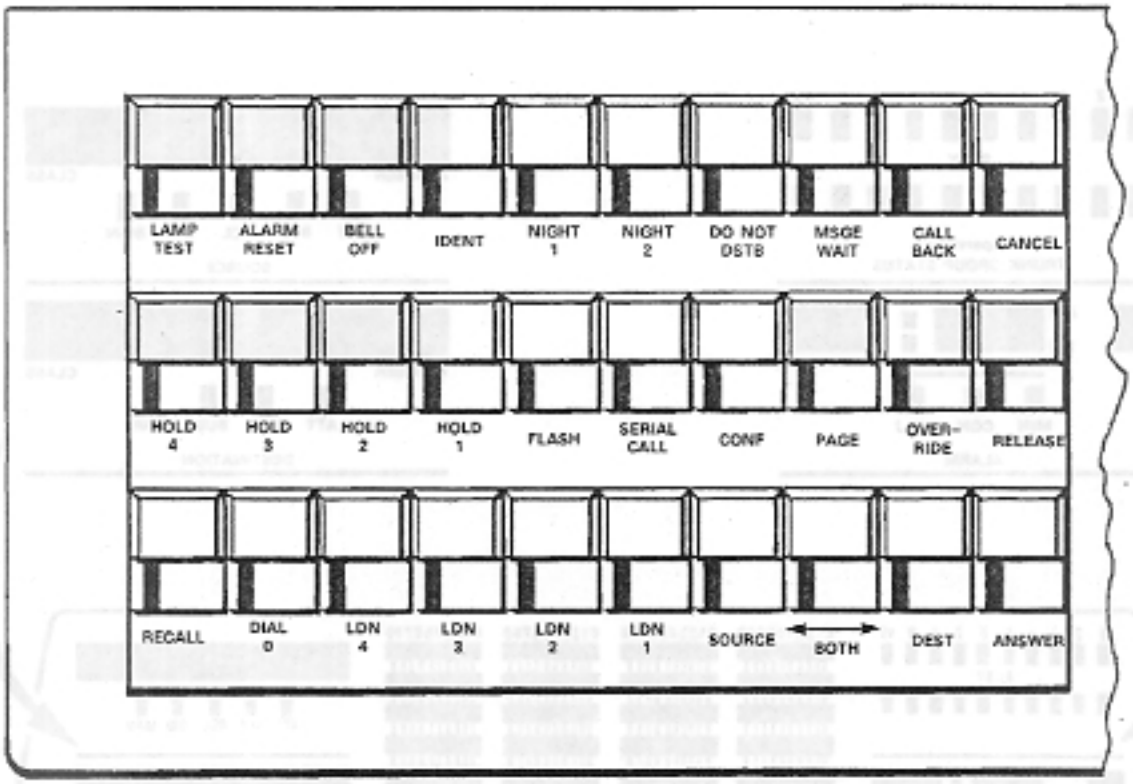


Figure 4-1(a) Supervisor Console Faceplate



X3104

Figure 4-1(b) Supervisor Console Keyboard

the former mode. If the console is locked in the "lamp test" mode, a situation requiring supervisor service will terminate this mode, and return the console to its normal operation. This prevents the supervisor from accidently locking the console in the "lamp test" mode (which is silent), and missing console requests.

4.04 **ALARM RESET:** If a minor alarm condition is detected by the system, the console ALARM LED flashes (see ALARM indicators description) and the tone ringer sounds. Pressing the ALARM RESET button cuts off the tone ringer and causes the error code associated with the alarm condition to be displayed in the SOURCE and DESTINATION displays. The ALARM RESET button, if pressed when an alarm condition does not exist, causes all busied out trunks and lines, and all locked out lines to be displayed on the Equipment Status Field.

4.05 **BELL OFF:** This button, when pressed, disables the console tone ringer and lights the BELL OFF LED. When the console ringer is disabled, incoming calls to the supervisor console are indicated by a flashing LED and by the Calls Waiting Display, and no audible signal is given. If the BELL OFF button is pressed when its associated LED is lit, the tone ringer will be reactivated and the LED is extinguished. This button can be polled by a visually impaired supervisor (refer to 4.34).

4.06 **IDENT:** Pressing the IDENT button when the console is idle causes the console to display the firmware generic number and its revision level in the SOURCE display, and the internal firmware code and the console number in the DESTINATION display (see Figure 4-2):

- 0 = Maintenance/Programming console
- 1 = Supervisor Console 1
- 2 = Supervisor Console 2

If the button is pressed while the console is connected to either a source or destination party, the system will display the equipment number and speech path in use (Figure 4-3). Also, the time display changes to display the current date by showing the 2-digit day and 2-digit month. If the button is held down for more than 5 seconds, the year will appear in the time display.

4.07 **NIGHT 1, NIGHT 2:** These buttons are used to switch the system into and out of Night Service. When a night service button is pressed, the LED (associated with the night service selected) lights, and the system switches the selected incoming trunks to the required TAFAS equipment or extension lines. Pressing the NIGHT 1/2 button(s) returns the system to normal service. NIGHT 1 and 2 cannot be active at the same time. A flashing LED indicates that call forwarding is set up from the console.

4.08 **CALLBACK:** Pressing the CALLBACK button allows the supervisor to activate the callback feature on a call originated at the console.

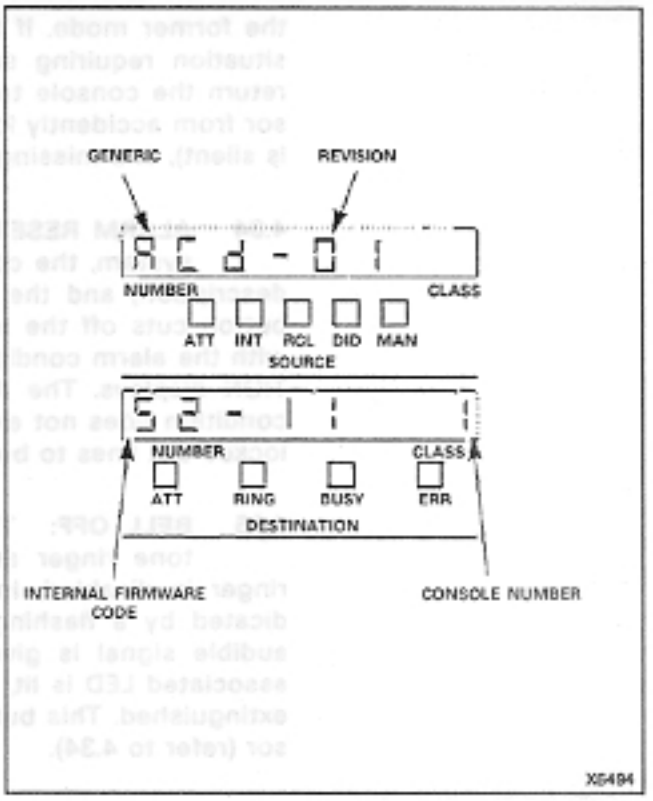


Figure 4-2 Typical Identification Display

4.09 DO NOT DSTB: This feature allows an extension user to have all calls diverted to reorder tone or to the supervisor. It may be activated by the extension user or the supervisor. The supervisor may see which extensions have the DO NOT DSTB set, on the equipment status field, by pressing the DO NOT DSTB button when the console is idle. When active, and the supervisor calls the extension, the console DO NOT DSTB LED flashes, and the ERR lamp lights in the DESTINATION display. The supervisor may override this by pressing the DO NOT DSTB button, and the extension will be rung.

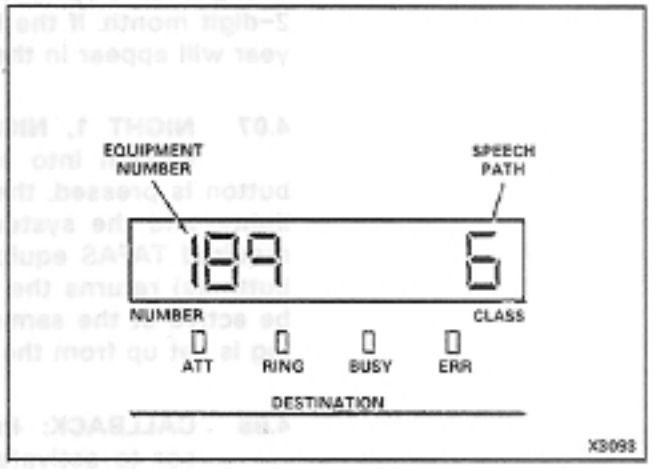


Figure 4-3 Typical Display

4.10 **MSGE WAIT:** This feature allows the Supervisor to inform an extension that there is a message waiting. This may be done by either a flashing neon lamp (at 60 ipm) on the extension set, or a distinctive ring every 20 minutes (3 cycles of 3.5 ips ringing). If the extension is busy or has DO NOT DISTB active when Message Waiting is activated, the message waiting indication is initiated after the extension becomes idle or when Do Not Disturb is removed. The Supervisor may see which extensions have a message waiting on the equipment status field, by pressing the MSGE WAIT button when the console is idle.

4.11 **CANCEL:** The CANCEL button allows the Supervisor to cancel a misdialed call, or a call directed to a busy number.

4.12 **HOLD 1, 2, 3, 4:** These buttons allow the Supervisor to hold up to four independent calls at the console. When the Supervisor presses a HOLD button, the associated LED lights and the active call at the console is held. If the Supervisor, or an extension using the HOLD PICKUP feature, does not retrieve the held call within the hold recall time, the HOLD LED flashes indicating that the call has been returned to the console. In the case of a visually impaired Supervisor, a distinctive audible signal is provided. If two consoles are used, up to eight calls may be held, calls 1, 2, 3 and 4 being held at Console 1 and calls 5, 6, 7 and 8 being held at Console 2. Console 1 and the Maintenance Console share the same four hold circuits. Each of the HOLD buttons can be polled by a visually impaired Supervisor for determination of which HOLD circuit is activated (refer to 4.34).

4.13 **FLASH:** This button allows the supervisor to recall the telephone company operator on an operator-assisted long-distance call. The FLASH button may be alternately programmed as the SERIAL CALL button or as the MONITOR key.

4.14 **SERIAL CALL:** Pressing the SERIAL CALL button before the supervisor extends an incoming call, causes the call to be returned to the console when the called party terminates the call.

4.15 **CONF (Conference):** The CONF button is used to set up a supervisor-controlled conference. The supervisor dials each conference in turn, and, after the answer, presses the CONF button to enter them into the conference. The CONF LED is lit whenever the conference is active. The supervisor may be recalled to the conference by one of the parties in the conference flashing the extension switchhook. This causes the CONF LED to flash. For the case of a visually impaired supervisor, a distinctive audible signal is generated (refer to 4.34). The supervisor answers the recall by pressing the CONF button, which reconnects the supervisor to the conference.

4.16 **PAGE:** Pressing the PAGE button connects the console handset or headset directly to the paging equipment, allowing the Supervisor to make all-zone paging announcements. If multi-tenant service is in operation Supervisor console 1 may access pager 1 and Supervisor console 2, pager 2. Shared consoles access both zones. The PAGE LED is lit whenever the paging circuit is in use. The Supervi-

sor has priority access to the paging circuits and may override any extension that is using the paging equipment by pressing the PAGE button (the extension is automatically released and receives reorder tone).

4.17 **OVERRIDE:** This button allows the supervisor to override a busy number and enter the call. An audio intrusion tone is issued to the extension being overridden before the supervisor is connected.

4.18 **MONITOR:** This button allows the supervisor to silently override an extension, i.e., no intrusion tone.

4.19 **RELEASE:** The RELEASE button allows the supervisor to release a call from the console. The call may be released in the busy or the ringing state, or after a talking connection has been established.

4.20 **RECALL:** The RECALL LED flashes to indicate that a call has not been answered within the time-out period and has been returned to the console. Pressing the RECALL button connects the console to the returned call.

4.21 **DIAL 0:** When an extension user calls the supervisor, the DIAL 0 LED flashes. If the DIAL 0 button is pressed, the console will be connected to the call. The LED may also indicate intercepts, callbacks, recalls, manual lines, contact monitors and serial call recalls.

4.22 **LDN 1, 2, 3, 4:** These buttons allow the supervisor to answer incoming calls to the customer's Listed Directory Numbers (LDN). When an outside call is made to the console, the LED associated with the incoming call flashes, allowing the supervisor to select the call by pressing LDN 1-4 and answer with the correct response.

4.23 **SOURCE:** This button allows the supervisor to hold the destination side of a call, and speak privately to the source party.

4.24 **BOTH:** The BOTH button allows the supervisor to speak simultaneously to both parties of a call.

4.25 **DEST (Destination):** This button allows the supervisor to hold the source side of a call, and speak privately to the destination party.

4.26 **ANSWER:** The ANSWER button allows the supervisor to answer any incoming call to the console. When a call is presented to the console, the LED associated with the call type and the ANSWER LED flash. A distinctive audible signal is given to allow the answer by a visually impaired person. If the supervisor presses the ANSWER button, the LED associated with the first call in the console queue lights, indicating the call type, and the ANSWER LED lights indicating the supervisor is connected to the call. The LEDs associated with the remaining calls in the console queue continue to flash. Pressing the ANSWER button to answer incoming calls, will answer calls to the

console in the order in which they arrive at the console, independent of the call type.

Displays

4.27 The console displays provide the supervisor with all relevant information on calls directed to or made by the supervisor. The following descriptions detail the information provided by each display.

4.28 **TRUNK GROUP STATUS:** The Trunk Group Status Display shows the operational status of ten trunk groups. Two LEDs are associated with each trunk group. The BUSY LED, when lit, indicates that all trunks in that Trunk Group are busy. The SUPERVISOR LED, when lit, indicates that the supervisor has made the trunk group "supervisor access only".

4.29 **CW (Call Waiting):** The Call Waiting Display shows the current number of calls in the supervisor queue. As calls are answered, or new calls are directed to the console, the display is updated to reflect the new status of the queue.

4.30 **TIME:** Each Supervisor console is equipped with a digital clock. The clock continuously displays the time in hours and minutes, with a choice of either a 12- or 24-hour clock display. If the 12-hour clock display is selected, a LED lights to indicate AM or PM. Optionally, the date might be displayed by pressing the IDENT button. The clock is driven by pulses derived from the CPU master clock circuit, and is therefore a direct indication that the CPU is working.

4.31 **ALARM:** The Alarm Display contains the MAJ (major), MIN (minor) and CON (console) alarm LEDs. When the system detects an alarm condition, the appropriate LED flashes or lights, and the console ringer sounds. A MAJOR alarm indicates that a malfunction has been detected which affects complete system operation, and an emergency transfer has taken place. A MINOR alarm is raised when the system detects a fault which degrades system operation, but does not stop processing. The MINOR alarm causes a distinctive audible signal to be given (refer to 4.32). A CONSOLE alarm indicates that a malfunction has occurred within the console. Call processing continues but the console operation is impaired.

4.32 **EQUIPMENT STATUS FIELD:** The Equipment Status Display shows the busy (LED lit), idle (LED dark), or held (LED flashing) states of the trunk and/or extension numbers (up to 200). The numbers displayed may be assigned to any extension, tie trunk, or CO trunk. The Display may also show Do Not Disturb, Message Waiting, Room Status and Busied-Out conditions.

4.33 **SOURCE:** The SOURCE display (see Figure 4-4) consists of eight 7-segment and five LED displays, which provide the following information on all calls directed to the console:

- NUMBER – displays the number of the calling extension or the equipment number of a calling trunk.

- CLASS – this area shows the Class-of-Service number assigned to the calling extension or trunk.
- ATT – this LED, when lit, indicates that the supervisor is connected to the calling source party.
- INT – this LED lights to indicate that the call is an intercept call.
- RCL – when lit, identifies the call as a recall.
- DID – identifies the call as a Direct Inward Dial call to the Supervisor.
- MAN – identifies the call as a manual line service call.

This display is also used to read out other information (refer to Section MITL9105/9110- 096-500-NA).

4.34 **DESTINATION:** The DESTINATION display (see Figure 4-5) holds eight 7-segment and four LED displays which provide the following information on all calls made from the console:

- NUMBER – displays the extension number or the trunk equipment number dialed by the Supervisor.
- CLASS – displays the Class-of-Service number assigned to the called extension or trunk.
- ATT – this LED, when lit, indicates that the supervisor is connected to the called destination party.
- RING – indicates that the call is in the ringing state.
- BUSY – indicates that the called party is busy.
- ERR – indicates that the number dialed is unassigned or illegal.

This display is also used to read out other information (refer to Section MITL9105/9110-090-500-NA).

Audible Incoming Discrimination

4.35 The console incorporates audible signal discrimination. Under some conditions requiring Supervisor service, distinctive audio codes are issued by the tone ringer. With this facility, visually impaired supervisors can operate the console and be aware of the various calling-in situations that can arise. These situations are as follows:

- Incoming calls, i.e., LDN calls, DIAL 0 calls or RECALLs.

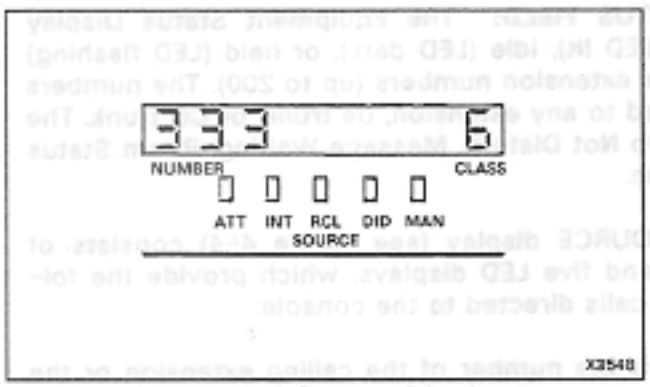


Figure 4-4 Source Display

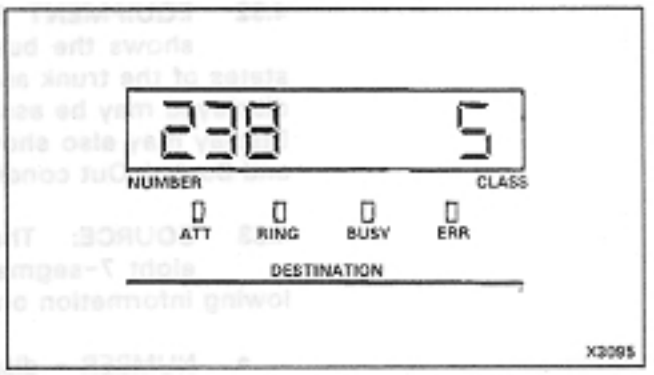


Figure 4-5 Destination Display

- HOLD connection time-outs.
- A "flash-for-supervisor" occurring during an Supervisor-Controlled Conference.
- A MIN Alarm LED flashing.

4.36 For use by a visually impaired supervisor, all events requiring supervisor recognition are placed in a queue and give an audible signal on a first-in, first-out basis. In the case of the first situation (LDNs, DIAL 0 or RECALL), the same audible signal is given indicating that the call can be answered with the ANSWER button. To find the actual button, the visually impaired operator can poll the keyboard (refer to 4.36). The remaining events have distinctive audible signals and may be readily associated with the relevant button. Figure 4-6 illustrates these tone cadences, each of which has a period of one second.

Keyboard Polling

4.37 For proper operation of the console a visually impaired supervisor must be aware of the status of the keyboard. For example, he or she must know whether the BELL OFF or NIGHT 1 button has been enabled. To do this the supervisor presses the LAMP TEST button in the silent mode (the ringer is off, the 7-segment indicators are on and the LEDs are off). While this button is held depressed, the remaining relevant buttons are pressed in turn. If the LED associated with a button is lit, the ringer will sound as long as the button is pressed down. If the LED is flashing, the ringer will give a 0.5 second on, 0.5 second off audible signal. In this manner the status of the BELL OFF, NIGHT 1 or any button (including an incoming call) can be determined and appropriate action taken. When this operation takes place, the LAMP TEST button is the last to be released, otherwise the current button being polled will become active when the LAMP TEST is released first.

5. OPTIONAL BUTTON FUNCTIONS

General

5.01 The standard commercial console faceplate layout is shown in Figure 4-1(a) and 4-1(b). Certain optional button functions may be used for a hotel/motel System installation as described in this Part. However these button functions are not restricted to this environment, but can be usefully applied if required to a commercial (business) type of System installation.

5.02 The buttons affected are shown below, with the first (or standard function) being changed to the second (or hotel/motel function) item:

- NIGHT 2 becomes ROOM RESTR (or ROOM STATUS)
- HOLD 4 becomes CALL BLOCK

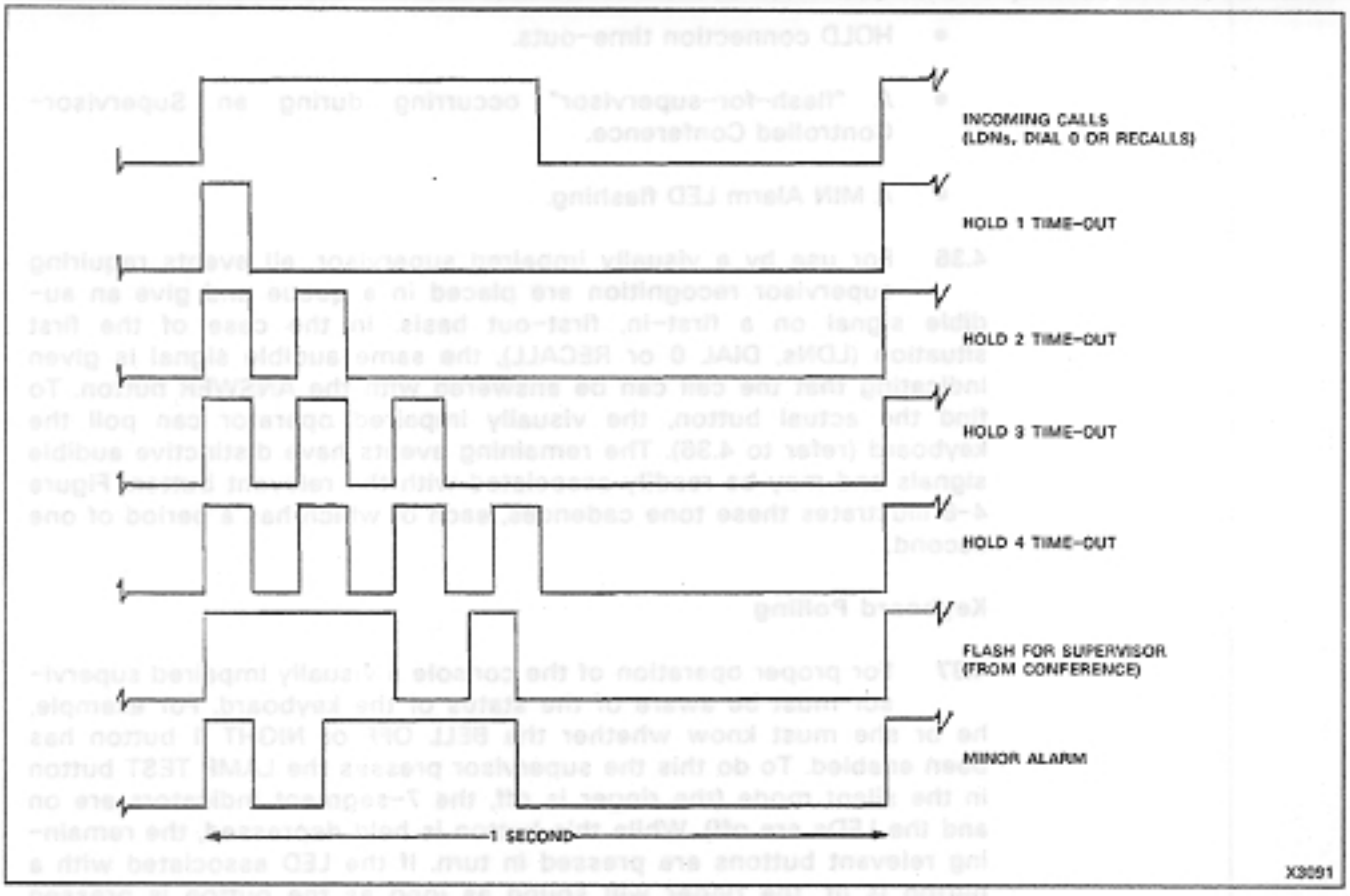


Figure 4-6 Audible Tone Signal Cadences

- SERIAL CALL becomes GUEST ROOM
- FLASH becomes SERIAL CALL.

5.03 The description of the optional buttons and displays is discussed in the following paragraphs.

5.04 **GUEST ROOM:** This button is used to give a number of facilities specifically for hotel or motel use. Its prime purpose is to display information about a hotel room and to give room occupants additional facilities (or restrictions). These features are summarized as follows:

(a) The display of the status of each room can be given in respect to whether it is occupied (rented) or vacant, and whether it is clean or requires cleaning. In addition, the display indicates whether the maid is in the room. This display is accomplished by pressing the GUEST ROOM button and dialing the room number. Figure 5-1 shows a typical room display with status "3", indicating that the room is vacant but requires cleaning. If a period (.) appears after the status code, it indicates that a maid is currently in the room. Having pressed the GUEST ROOM button and dialed a room number, the supervisor can update the room status by dialing a special code (see Table 5-1). This

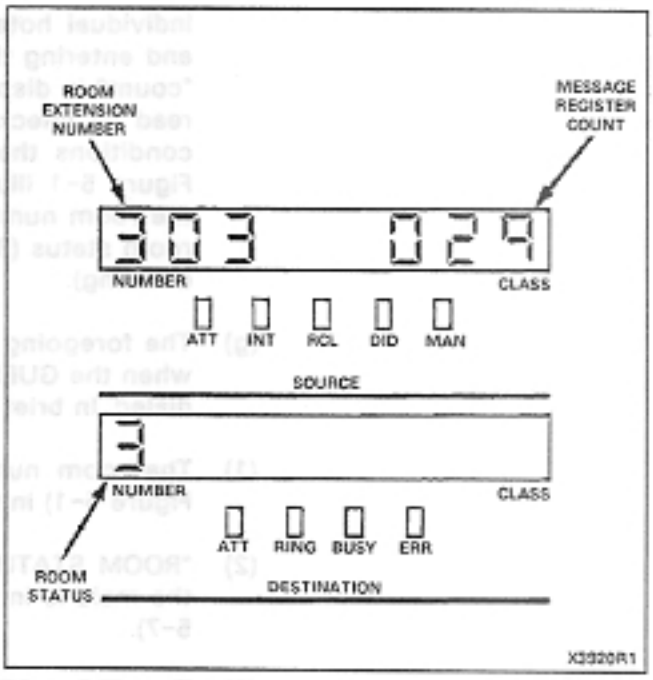


Figure 5-1 Typical Status Display

also provides the supervisor with a view of a room's status when viewing the Room Status field, after pressing the GUEST ROOM button and dialing an extension.

(b) A vacant room (i.e. code 1 or 3 in Table 5-1), may be restricted from making outgoing trunk calls. A similar restriction can be applied by the use of the ROOM RESTR button for "nonvacant" rooms. This facility is detailed under the ROOM RESTR description.

(c) A hotel guest may request that all calls to his or her room be intercepted by the supervisor; i.e., a "DO NOT DISTURB" condition is required. This condition may be overridden in an emergency. The details are given in the description for the DO NOT DSTB button.

(d) The hotel Supervisor can inform a hotel and guest that he or she has a message waiting, by arranging for the room telephone to ring, or to flash a lamp every 20 minutes. This facility is discussed more fully in the description for the MSGE WAIT button.

(e) If the room telephone has a Message Waiting lamp, the lamp will flash (at 60 ipm) for the "Message Waiting" period. Only one type of Message Waiting indication can be employed by the system at any time.

(f) Message registration can be provided for each room. This feature keeps count of all local calls made from a room. Flexible charging allows the Message Register to be tailored to an

individual hotel's needs. By pressing the GUEST ROOM button and entering the room number, the room number and message "count" is displayed in the SOURCE display. The "count" can be read on checkout for charging purposes; then under the same conditions the register is cleared by pressing the "#" button. Figure 5-1 illustrates a typical display of this facility showing the room number (303), the message register total (29) and the room status (3 - indicating that the room is vacant but requires cleaning).

(g) The foregoing facilities, and message registration are displayed when the GUEST ROOM button is pressed and the room number dialed. In brief these are:

(1) The room number and the "MESSAGE REGISTER" status (see Figure 5-1) in the SOURCE display.

(2) "ROOM STATUS" indicated by a digit (followed by "." (period) if the maid is in the room) in the DESTINATION display (see Figure 5-7).

(3) The "DO NOT DISTURB" status (indicated by DO NOT DSTB lamp).

(4) The "MESSAGE WAITING" status (indicated by MSGE WAIT lamp).

(5) The "CONTROLLED OUTGOING RESTRICTION" status (indicated by ROOM RESTR lamp).

5.05 **CALL BLOCK:** Rooms may be restricted from calling other rooms for specific time periods. This restriction is controlled by the supervisor. When the console CALL BLOCK button is pressed, the restriction is set up for calls (usually during the night period), and the associated LED will light. Upon pressing the CALL BLOCK button again, the restriction is lifted and the LED will be extinguished. Note that this feature requires additional programming (see Section MITL9105/9110-090-105-NA).

Note: The button features described in 5.06 and 5.07 are alternative features. The System can be either programmed with a "room status" facility (5.06) or with a "call-restrict" facility (5.07), and the button accordingly annotated either as ROOM STATUS or ROOM RESTR. It should be noted that the "room status" facility may still have the "call-restrict" function available, which is controlled automatically by the status of the room.

5.06 **ROOM STATUS:** The function of this button is to monitor the status of each room. Pressing this button and dialing one of five possible single-digit codes indicates (on the Equipment Status Field display) which rooms correspond to a particular status condition (by lighting the room LEDs on the display), and shows, in columns 3 to 5 of the SOURCE display, the total number of rooms with the status selected. For example, when digit 3 is dialed and held depressed, it

TABLE 5-1
ROOM STATUS CODE DESCRIPTION

Status Code	Description
0	Displays which rooms are currently occupied by a maid. This status cannot be changed by the supervisor.
1	The room is vacant and ready for occupancy.
2	The room is occupied and has been cleaned.
3	The room is vacant but needs cleaning.
4	The room is occupied but requires cleaning.
5	The room has been paid for by cash.

Note: Codes are dialed by supervisor after pressing ROOM STATUS button, to result in Equipment Status Field displays (see 5.06).

OR

Supervisor uses GUEST ROOM button and dials room number to obtain a DESTINATION display (see 5.04 and Figure 5-1); digits 1-4 are shown, with a period (.) if the maid is in the room.

indicates that those rooms are vacant but are not available for renting (e.g. they may require cleaning). Table 5-1 lists the dial codes (status) and their significance. If the "room status" option is not programmed in the system and it is still required to restrict outgoing calls, then the ROOM STATUS button becomes the ROOM RESTR button (see 5.07).

5.07 **ROOM RESTR (Outgoing Call Restriction):** The ROOM RESTR button is used to prevent unauthorized outgoing trunk calls from guest rooms. This feature is enabled or disabled by the supervisor pressing the GUEST ROOM button, dialing the room number and pressing the ROOM RESTR button. The ROOM RESTR lamp is lit when the restriction is active, and off when disabled. The ROOM RESTR button may be pushed while conversing with the extension. The ROOM RESTR button may be used in a similar manner for a commercial type of installation. In order to activate or deactivate the Outgoing Call Restriction, the supervisor need only press the ROOM RESTR button.

Maintenance Functions

5.08 Certain maintenance functions can be performed from the supervisor console (or from the test line). These functions are listed in Table 5-2 and, a full description of their use is contained in Sections MITL9105/9110-090-500-NA and MITL9105/9110-090-350-NA.

Supervisor Access Functions

5.09 A supervisor may perform certain system functions (such as setting the console clock accessing individual trunks, etc.) from the console. These are fully detailed in the Console Operating Instructions. A listing of these functions is also included in Table 5-3.

Supervisor Function Codes

5.10 When implementing the ACD features the supervisor is required to use various Supervisor Function Codes as listed in Table 5-4. See also Section MITL9105/9110-090-222-NA.

6. FUNCTIONAL DESCRIPTION – PROGRAMMING AND MAINTENANCE CONSOLE

General

6.01 The Programming and Maintenance Console has its 30-button assembly differently identified from that of the normal supervisor console button assembly. This is illustrated in Figure 6-1.

6.02 The programming may be simulated by placing a Programming Overlay Set over the button assembly of a normal supervisor console, when it is desired to use this console for programming functions. The overlay consists of a spiral-bound set of three overlays printed on each side (see Figure 6-2), which are used for the following purposes:

(a) **Commercial Console Overlay** – Simulates the button appearances of a commercial console when placed on a programming console. This is to enable a programming console to duplicate the commercial console functions when required.

(b) **Hotel/Motel Overlay** – Simulates the button appearances for a Hotel/Motel supervisor console.

(c) **Programming Console Overlay** – Used with a commercial supervisor console for programming purposes when a programming console is not available.

(d) **Extended Programming Overlay, Toll Control and Speed Call** – Used to program Toll Control and/or Speed Call features when required (refer to Part 7).

(e) **Extended Programming Overlay, Automatic Route Selection** – Used to program Automatic Route Selection features when required (refer to Part 7).

TABLE 5-2
MAINTENANCE FUNCTION ACCESS CODES

R3

To select any of the functions, the access code assigned for the maintenance function must be dialed (Feature Number 19). The code 555 is used in the following part for the maintenance code. This may be dialed from the test line or console.

Clear all errors:

a) Dial 555 + 1

Direct trunk or station access:

a) Dial 555 + 20
b) Dial individual equipment number (3-digit equipment number for trunk or station)

Busy out of a receiver

a) Dial 555 + 3
b) Dial equipment number of receiver

Busy out of a speech path:

a) Dial 555 + 33
b) Dial speech path number (01-31)

De-busy a receiver

a) Dial 555 + 4
b) Dial equipment number of receiver

De-busy a speech path:

a) Dial 555 + 43
b) Dial speech path number (01-31)

Initialize card slot:

a) Dial 555 + 5
b) Dial card slot number (01-17, 31-42)

System reset (Notes 2 and 3):

a) Dial 555 + 6

To initiate system dump (from test line):

a) Dial 555 + 7 and hang up
b) Go off-hook
c) Dial 555 + 8 + # (or 2)

To initiate system dump (from console)

a) Dial 555 + 7
b) Dial ⁎14#
c) Press RELEASE button

To suspend printer (Note 3):

a) Dial 555 + 8 + ⁎ (or 1), or
b) Dial ⁎14⁎ console only

To enable printer (Note 3):

a) Dial 555 + 8 + ⁎ (or 2), test line
b) Dial ⁎14# console only
c) Press RELEASE button

To purge and ignore printer (Note 3):

a) Dial 555 + 8 + 00, test line
b) Dial ⁎1400 console only
c) Press RELEASE button

To print stored Customer Data:

a) Dial 555 + 9 + n, where n is:
   - 0 A complete print (Note 4)
   - 1 System Options, Feature Access Codes, Classes of Service, Hunt Groups and Extensions
   - 2 Trunk and Trunk Group Data
   - 3 Special Set Data
   - 4 Toll Control Data
   - 5 Speed Call Data
   - 6 Automatic Route Selection Data
   - ⁎ System-Wide Data (Note 5)
b) Press RELEASE button

Notes:
1. For Traffic Measurement Access Codes see MITL9105/9110-090-450-NA.
2. The thumbwheel switches on the Tone Control card should be set to XXYX, where X = any digit 0 - 9 and Y cannot be the digit 7.
3. Requires System Option Programming.
4. This prints all sections.
5. This will print only the system-wide speed call tables and the system special set messages.

TABLE 5-3
SUPERVISOR FUNCTION ACCESS CODES

These codes assume the use of * as the Supervisor Function code (Feature Number 18). For Supervisor Function codes used in Traffic Measurement see Section MITL9105/9110-090-450-NA.

To cancel all call forwarding:

a) Dial *1, or *11
b) Dial #
c) Press RELEASE button

To access an individual trunk:

a) Dial *20
b) Dial individual trunk access number (equipment number)
c) Dial *
d) Press RELEASE button

To force-release an individual trunk:

a) Dial *20
b) Dial individual trunk access number (equipment number)
c) Dial ##
d) Press RELEASE button

To make flexible night service assignments (Note 3):

a) Dial *3
b) Dial individual trunk access number (equipment number)
c) Press NIGHT 1 or NIGHT 2
d) Dial extension number
e) Press RELEASE button

To cancel all system callbacks:

a) Dial *4
b) Dial #
c) Press RELEASE button

To set the clock time:

a) Dial *5
b) Dial time (2-digit hour plus 2-digit minutes)
c) Dial * for p.m., otherwise a.m.
d) Press RELEASE button

To make trunk group supervisor access only:

a) Dial *6
b) Dial trunk group (1 through 10)
c) Dial *
d) Press RELEASE button

To make trunk group extension and supervisor access:

a) Dial *6
b) Dial trunk group (1 through 10)
c) Dial #
d) Press RELEASE button

To change the Direct Inward System Access Code:

a) Dial *7
b) Dial DISA code
c) Press RELEASE button

To cancel a minor alarm (Note 1):

a) Dial *8
b) Dial #
c) Press RELEASE button

To busy out an individual trunk (Note 3):

a) Dial *9
b) Dial individual access number (equipment number)
c) Dial *
d) Press RELEASE button

To de-busy an individual trunk (Note 3):

a) Dial *9
b) Dial individual trunk access number (equipment number)
c) Dial #
d) Press RELEASE button

TABLE 5-3 (CONT'D)
SUPERVISOR FUNCTION ACCESS CODES

To change the status of all occupied clean rooms to occupied and needs cleaning:

a) Dial ⁎10
b) Dial ⁎
c) Press RELEASE button

To change the status of all occupied rooms in the need of cleaning to occupied clean:

a) Dial ⁎10
b) Dial #
c) Press RELEASE button

To set up call forwarding:

a) Dial ⁎11nnn, where nnn is the extension number of the forwarding extension
b) Dial call forwarding code (1-5)
c) Dial mmm, where mmm is the number to which the calls are to be forwarded
d) Press RELEASE button

To cancel call forwarding for an extension:

a) Dial ⁎11nnn, where nnn is the extension number of the forwarding extension
b) Dial #
c) Press RELEASE button

To display call forwarding set for an extension:

a) Dial ⁎11nnn, where nnn is the extension number of the forwarding extension
b) Press RELEASE button

To cancel all call forwarding:

a) Dial ⁎1# or ⁎11#
b) Press RELEASE button

To busy out an extension (Note 3):

a) Dial ⁎12nnn, where nnn is the number of the extension to be busied out
b) Dial ⁎
c) Press RELEASE button

To de-busy an extension (Note 3):

a) Dial ⁎12nnn, where nnn is the number of the extension to be de-busied
b) Dial #
c) Press RELEASE button

To suspend the printer (Note 3):

a) Dial ⁎14⁎
b) Press RELEASE button

To purge and ignore the printer (Note 3):

a) Dial ⁎14 00
b) Press RELEASE button

To enable the printer (Note 3):

a) Dial ⁎14 #
b) Press RELEASE button

To change the date:

a) Dial ⁎15 and 3- or 4-digit date (1- or 2-digit month, 2-digit day)
b) Press RELEASE button

To print the room register audit (Notes 2 & 3):

a) Dial ⁎16
b) Press RELEASE button

To change the system identity (Note 3):

a) Dial ⁎17nnn (1- to 3-digit ID, 0-999)
b) Press RELEASE button

To display current system identity:

a) Dial ⁎17
b) Press RELEASE button

To print the "room status" audit (Note 2):

a) Dial ⁎18
b) Press RELEASE button

TABLE 5-3 (CONT'D)
SUPERVISOR FUNCTION ACCESS CODES

To print stored customer data (Note 4):

a) Dial ✱19 + n, where n is:
   - 0 A complete print (Note 5)
   - 1 System Options, Feature Acess Codes, Classes of Service, Hunt Groups and Extensions
   - 2 Trunk and Trunk Group Data
   - 3 Special Set Data
   - 4 Toll Control Data
   - 5 Speed Call Data
   - 6 Automatic Route Selection Data
   - ✱ System-Wide Data (Note 6)

b) Press RELEASE button

Notes:
1. The errors will be sequentially stacked in the memory and may be recalled sequentially (most recent first) by repeating the above procedure.
2. Printer starts after RELEASE button is pressed.
3. Requires system option programming.
4. The customer must have programming access to the features in order to request a print-out.
5. This prints all sections provided the customer has programming access to the features.
6. This will print only the system-wide speed call tables and the system special set messages.

TABLE 5-4
SUPERVISOR FUNCTION CODES

To specify the maximum MTTA for each Agent Group, and at the same time the overflow destination for all incoming calls when the MTTA exceeds this maximum:

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

To display the current maximum time to answer and overflow code:

- Dial *246
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button to terminate display.

To specify the after-call work time applicable to all Agents in each Agent Group:

- Dial *245
- Dial Agent Group Access Code
- Dial work time, in 2-digit seconds
- Dial * to enter another Agent Group number or
- Press the RELEASE button when finished.

To program a RAD:

- Dial *230
- Dial the RAD equipment number
- Dial * to proceed to the next equipment
- Press the RELEASE button.

To program a RAC:

- Dial *231
- Dial the RAC equipment number
- Dial * to proceed to the next equipment
- Press the RELEASE button.

To delete a RAD:

- Dial *230
- Dial the RAD equipment number
- Dial #
- Press the RELEASE button.

TABLE 5-4 (CONT'D)
SUPERVISOR FUNCTION CODES

To delete a RAC:

- Dial ⁎231
- Dial the RAC equipment number
- Dial #
- Press the RELEASE button.

To review all defined RADs/RACs:

- Dial ⁎232⁎ – the first RAD/RAC equipment number programmed will appear in the SOURCE display in the left corner and a 0 in the right corner to indicate a RAD or 1 in the right corner to indicate a RAC
- Dial ⁎ to advance to next RAD/RAC or press the RELEASE button to terminate.

To record a message on the RAC:

- Dial ⁎240
- Dial RAC equipment number
- Dial ⁎
- Supervisor waits until a 50 msec "beep" is heard
- Supervisor speaks message (up to 8 seconds in duration) into handset
- Press the RELEASE button when finished.

To playback a message from a RAC:

- Dial ⁎241
- Dial RAC equipment number
- Dial ⁎
- Message will be heard with handset, otherwise busy tone will be heard if the recording is currently in use
- Press the RELEASE button to terminate.

To specify the length of the message:

- Dial ⁎242
- Dial the Recording Group Access Code
- Dial the recording duration, in 2-digit seconds.

To specify the recordings and delay times for an Agent Group:

- Dial ⁎243
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial Access Code
- Dial time delay, in 2-digit seconds
- Dial ⁎ to enter another recording number or
- Press the RELEASE button.

TABLE 5-4 (CONT'D)
SUPERVISOR FUNCTION CODES

To review recording assignments:

- Dial ⁎244
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial ⁎ to review another recording assignment or
- Press the RELEASE button.

To delete all data associated with an Agent Group (maximum MTTA, overflow specification, Recording Group and delay time assignments):

- Dial ⁎243
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button.

To define which Recording Group a DID Intercept will be routed to:

- Dial ⁎233
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete DID intercept routing:

- Dial ⁎233
- Dial #
- Press the RELEASE button.

To define which Recording Group an Automatic Wake-Up will be routed to:

- Dial ⁎234
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete which Recording Group an Automatic Wake-Up will be routed to:

- Dial ⁎234
- Dial #
- Press the RELEASE button.

To examine the current status of an Agent Group:

- Dial ⁎247
- Dial Agent Group Access Code
- Press the RELEASE button to terminate.

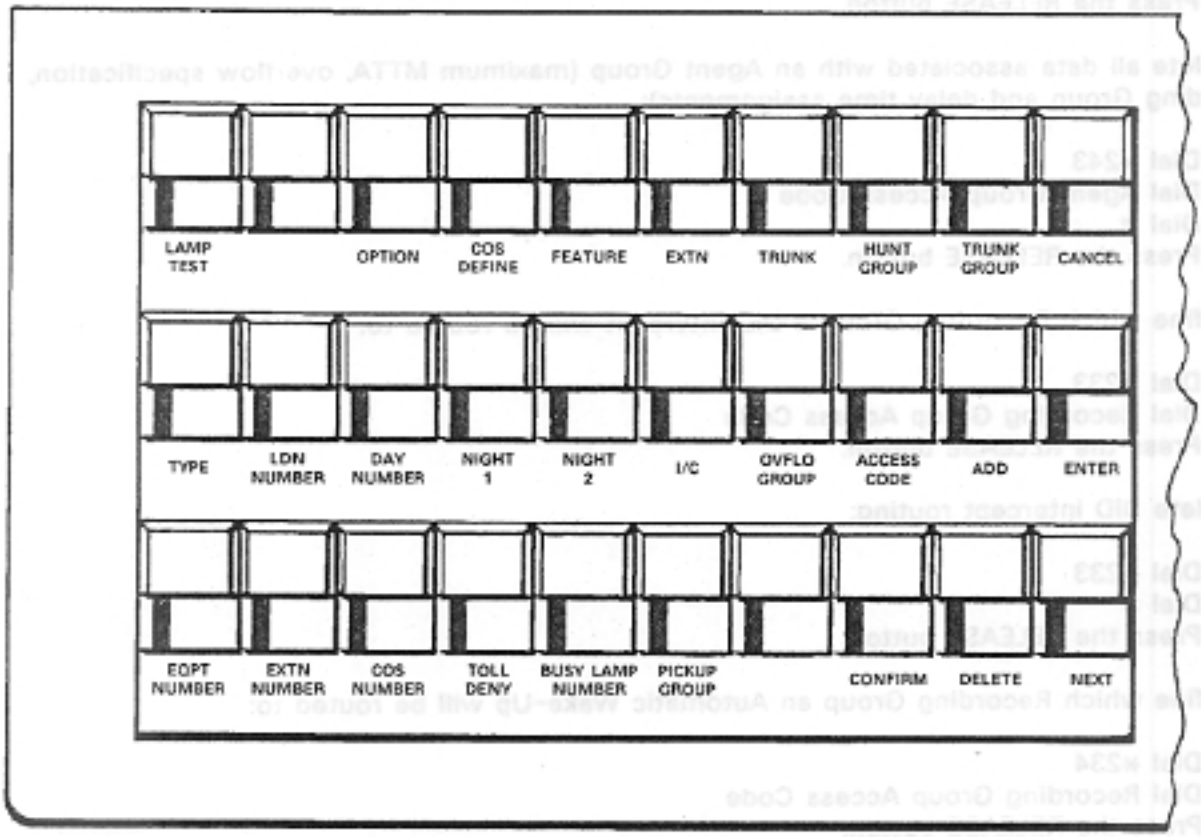
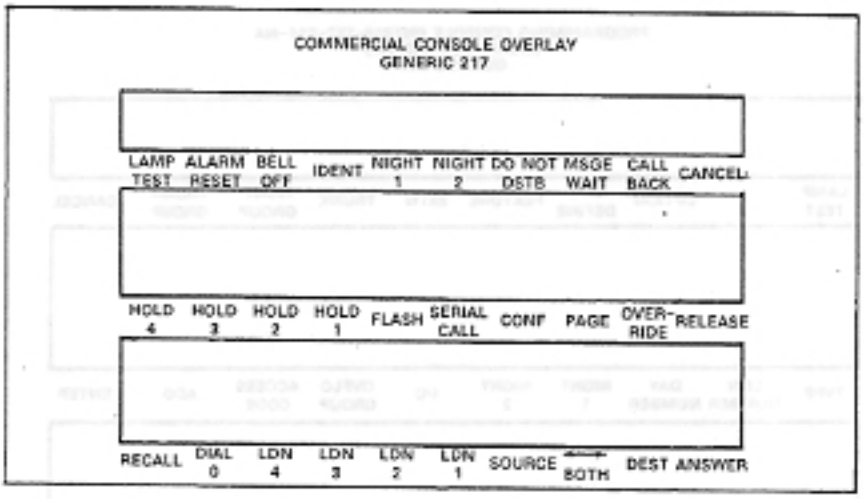
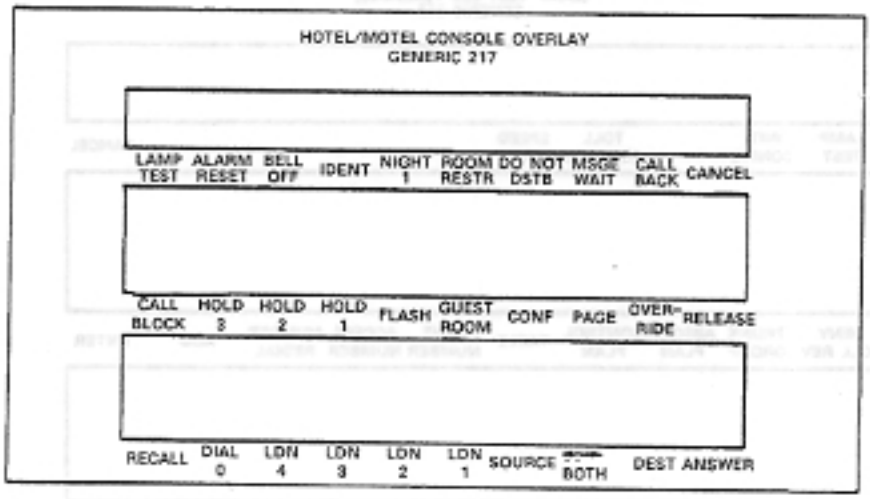


Figure 6-1 Programming and Maintenance Console Keyboard Layout



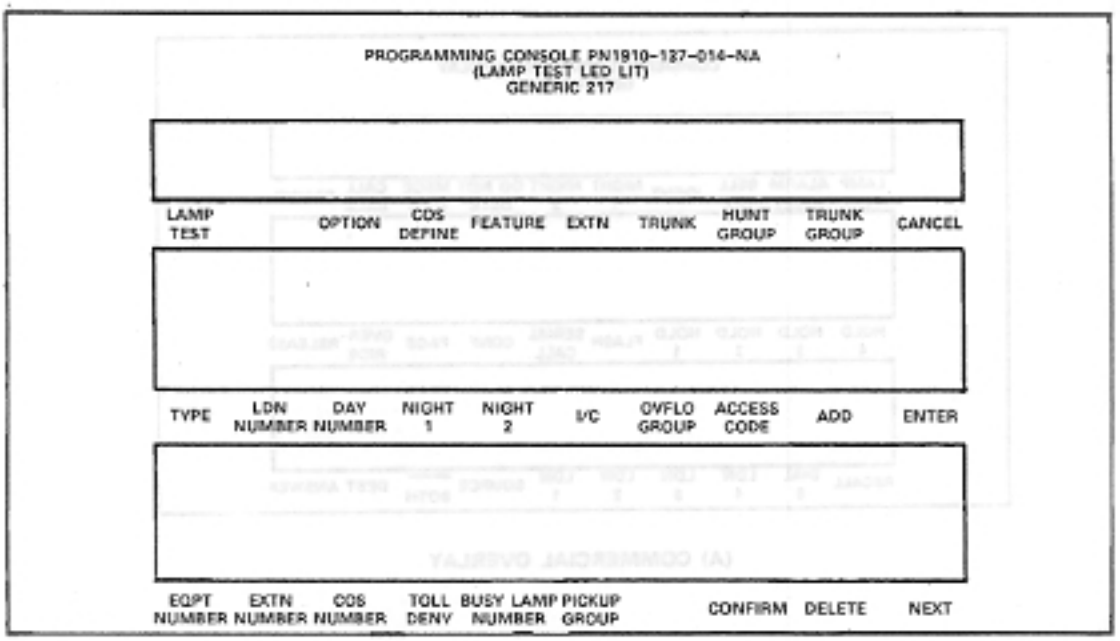
(A) COMMERCIAL OVERLAY



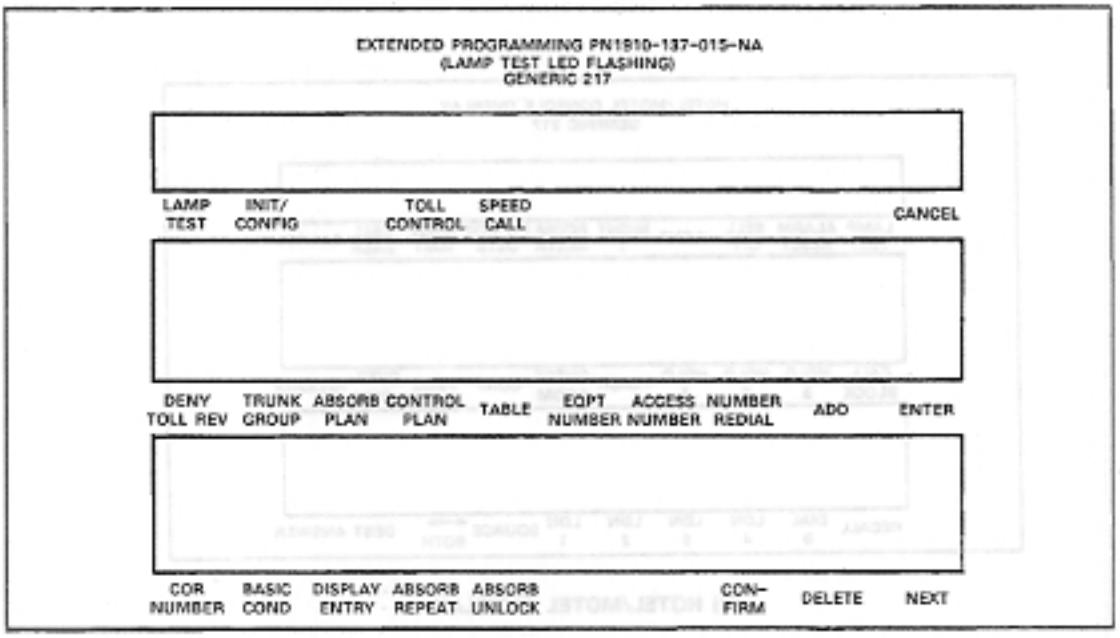
(B) HOTEL/MOTEL OVERLAY

X515280

Figure 6-2 Programming Overlay Set



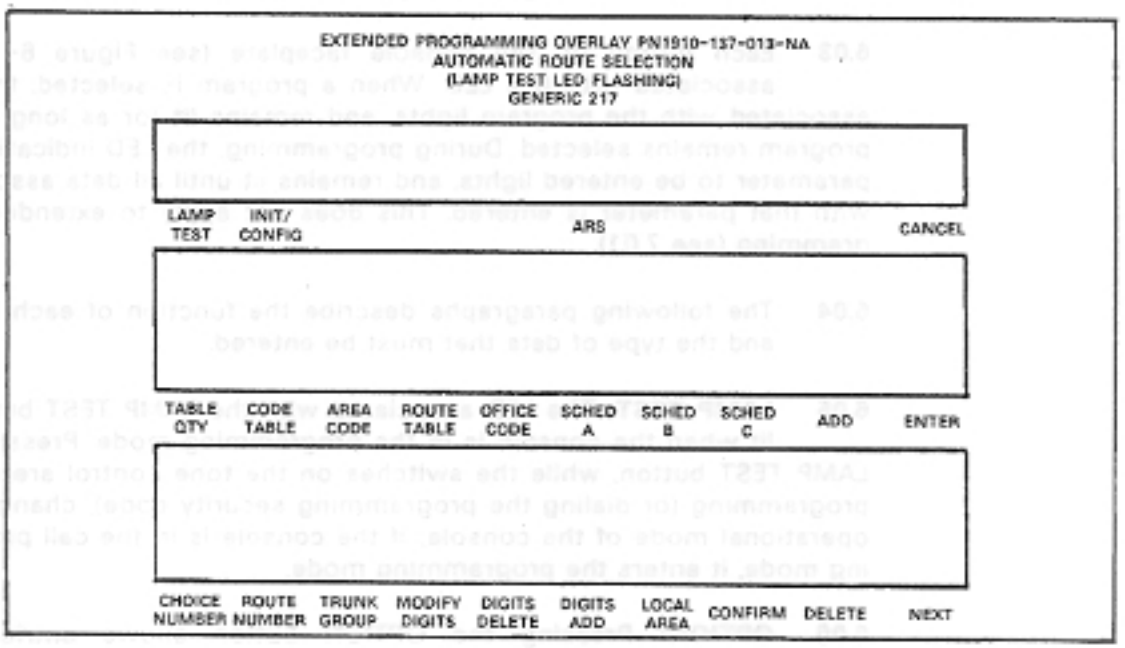
(C) PROGRAMMING OVERLAY



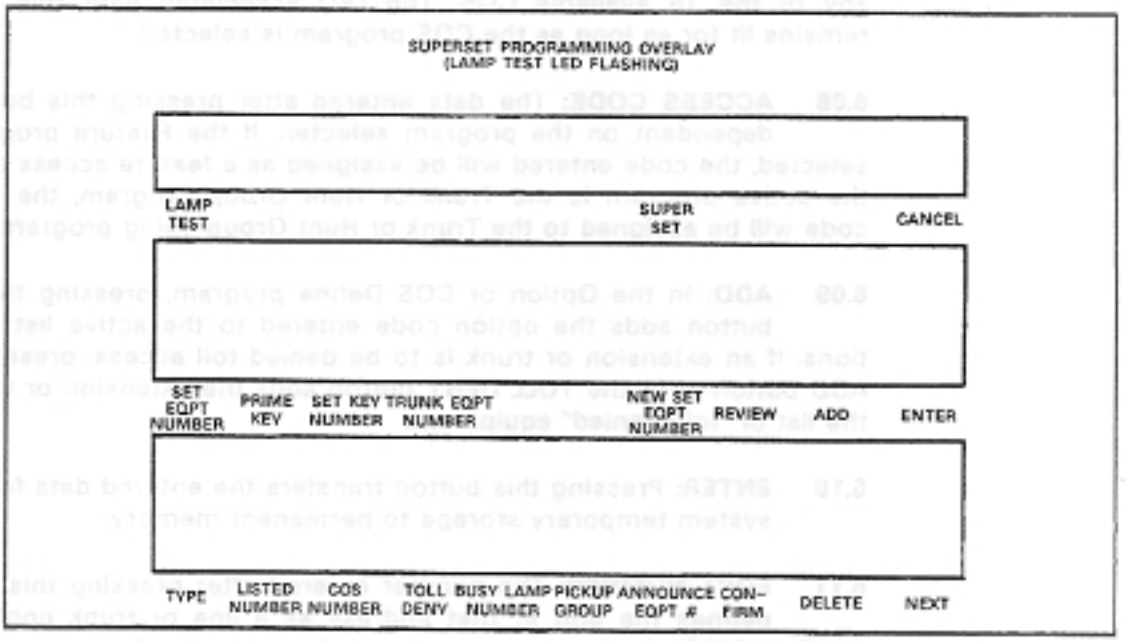
(D) EXTENDED PROGRAMMING (TOLL CONTROL AND SPEED CALL) OVERLAY

X5981A

Figure 6-2 Programming Overlay Set (Cont'd)



(E) (ARS) PROGRAMMING



(F) SUPERSET

X59818

Figure 6-2 Programming Overlay Set (Cont'd)

Buttons – Standard Programming Mode

6.03 Each button on the console faceplate (see Figure 6-1) has associated with it a LED. When a program is selected, the LED associated with the program lights, and remains lit for as long as the program remains selected. During programming, the LED indicating the parameter to be entered lights, and remains lit until all data associated with that parameter is entered. This does not apply to extended programming (see 7.01).

6.04 The following paragraphs describe the function of each button and the type of data that must be entered.

6.05 **LAMP TEST:** The LED associated with the LAMP TEST button is lit when the console is in the programming mode. Pressing the LAMP TEST button, while the switches on the tone control are set for programming (or dialing the programming security code), changes the operational mode of the console; if the console is in the call processing mode, it enters the programming mode.

6.06 **OPTION:** Pressing the OPTION button allows entries and changes to be made to the list of active system options. The LED associated with the button remains lit for as long as the OPTION program is selected. It is also used to define the active COS options of a specific COS, if the COS DEFINE program is selected.

6.07 **COS DEFINE:** Pressing this button selects the COS program and allows new entries to be made or existing entries changed in any of the 16 available COS. The LED associated with this button remains lit for as long as the COS program is selected.

6.08 **ACCESS CODE:** The data entered after pressing this button is dependent on the program selected. If the Feature program is selected, the code entered will be assigned as a feature access code. If the active program is the Trunk or Hunt Group program, the access code will be assigned to the Trunk or Hunt Group being programmed.

6.09 **ADD:** In the Option or COS Define program, pressing the ADD button adds the option code entered to the active list of options. If an extension or trunk is to be denied toll access, pressing the ADD button after the TOLL DENY button adds the extension or trunk to the list of "toll-denied" equipment.

6.10 **ENTER:** Pressing this button transfers the entered data from the system temporary storage to permanent memory.

6.11 **EQPT NUMBER:** The number entered after pressing this button defines the unit at that address as a line or trunk unit. If the EQPT NUMBER button is pressed and the address of an extension or trunk unit is entered while the Hunt or Trunk Group program is active, the equipment number is assigned to the Hunt or Trunk Group being defined.

6.12 **EXTN NUMBER:** The 1-, 2-, 3- or 4-digit number entered after pressing EXTN NUMBER button assigns the extension number to the equipment being programmed.

6.13 **FEATURE:** Pressing this button selects the Feature program and allows access codes to be assigned, changed, or removed for any feature. The FEATURE LED remains lit for as long as the program is selected.

6.14 **EXTN:** Pressing this button selects the Extension program and allows the data defining an extension to be made or changed. The EXTN LED remains lit while the Extension program is active.

6.15 **TRUNK:** Pressing the TRUNK button selects the Trunk program and allows the data describing each trunk to be entered or changed. The TRUNK LED remains lit while the Trunk program is active.

6.16 **HUNT GROUP:** Pressing this button allows equipment numbers forming a Hunt Group to be entered or removed from the system. The HUNT GROUP LED remains lit for as long as the Hunt Group program is active.

6.17 **TRUNK GROUP:** Pressing this button selects the Trunk Group program and allows new data describing each Trunk Group to be entered or existing data to be changed. The TRUNK GROUP LED remains lit for as long as the Trunk Group program is active.

6.18 **CANCEL:** Pressing the CANCEL button after making a data entry, will remove all new data from temporary storage, and allows the correct information to be entered.

6.19 **TYPE:** Pressing TYPE button allows the single-digit code identifying the type of trunk being programmed to be entered, or the 4-digit Trunk Group code to be entered when programming a Trunk Group.

6.20 **LDN NUMBER:** The single-digit entry made, pressing the LDN NUMBER button, while programming a trunk specifies the LDN appearance on the Supervisor Console at the trunk. If the trunk is not to appear on the Supervisor Console, no entry is required.

6.21 **DAY NUMBER:** Pressing this button allows the day assignment of a trunk to be entered. The trunk may be assigned to TAFAS equipment, individual extensions or the supervisor or Hunt Group.

6.22 **NIGHT 1 and 2:** These buttons allow the night assignment of incoming trunks to be made. The trunks may be assigned to TAFAS equipment, individual extensions or the supervisor or Hunt Group.

6.23 **OVFLO GROUP:** Pressing the OVFLO GROUP button allows the number of the Trunk Group to be entered. If all trunks within the Trunk Group being defined are busy, additional calls to the Trunk Group are routed to the overflow Trunk Group.

6.24 **COS NUMBER:** Pressing this button and dialing the required COS number allows the extension or trunk access to the features and service associated with the COS number entered.

6.25 **TOLL DENY:** The toll access of individual extensions and trunks may be specified by pressing the TOLL DENY, then pressing the ADD button (add this trunk or extension to the list of Toll Denied equipment) or the DELETE button (remove this extension or trunk from the list of Toll Denied equipment).

6.26 **BUSY LAMP NUMBER:** Pressing this button while programming an extension or trunk allows the busy lamp number associated with the equipment to be specified.

6.27 **PICKUP GROUP:** The entry made after pressing this button specifies the number of the pickup group of which the extension is to be a member.

6.28 **CONFIRM:** During assignment of busy lamp positions the CONFIRM LED may flash. This indicates that the busy lamp position entered is already assigned to some other equipment number. If the entry is correct, pressing the CONFIRM button will remove the existing data from that assignment and enter the new data into the system memory. If the data entered was not correct, the entry may be changed by pressing the button associated with the lit LED and keying the required information.

6.29 **DELETE:** If an extension or trunk is to have toll access, pressing the DELETE button after the TOLL DENY button removes the extension or trunk from the "toll-denied" list, allowing the equipment to have toll access. This button is also used to delete system options, COS option features, extensions, hunt groups, trunks and trunk groups from the data base.

6.30 **NEXT:** Entries in a program may be reviewed by selecting the desired program and pressing the NEXT button. Each time the NEXT button is pressed, the next entry in the program selected is displayed.

6.31 **I/C:** The I/C (INCOMING) button is used when programming DID or CCSA trunks. It is used in conjunction with the TRUNK button. When pressed it allows appropriate data to be entered to determine incoming dialed digit absorption and the addition of digits as required.

7. EXTENDED PROGRAMMING

General

7.01 Extended programming is used to program the extended non-volatile RAM. When the system is in Standard Programming mode the Extended Programming mode may be entered, as follows:

- If the top three thumbwheel switches are set to 777X on the Tone Control card, press the console LAMP TEST button, then the NEXT button.

- The LAMP TEST LED now flashes.

- The system is now in Extended Programming mode. The system may be programmed for the following features: Multi-Digit Toll Control (Section MITL9105/9110-090-212-NA), Speed Call (Section MITL9105/9110-090-220-NA), ARS (Section MITL9105/9110-090-231-NA), and SUPERSET 4™ (Section MITL9105/9110-090-210-NA).

- Extended Programming may be exited by depressing the LAMP TEST button followed by the NEXT button, which will put the system into Standard Programming mode.

Buttons – Toll Control Extended Programming Mode

7.02 The following paragraphs describe the buttons and the types of data that must be entered when programming Multi-Digit Toll Control and using the Extended Programming Overlay (see Figure 6-2(d)).

7.03 **CONFIG/INIT:** Pressing this button allows the extended non-volatile RAM to be initialized and selects a particular configuration of toll control memory tables.

7.04 **TOLL CONTROL:** Pressing this button initiates the selection of different programming modes of Multi-Digit Toll Control.

7.05 **DENY TOLL REV:** Pressing this button will enable the addition or deletion of Toll Reversal within a Control Plan.

7.06 **TRUNK GROUP:** Pressing this button allows the selection of a specific Trunk Group for programming of specific Toll Control parameters.

7.07 **ABSORB PLAN:** Pressing this button allows the definition or display of an absorb plan. If the system is in Toll Control Trunk Group Programming, this button may define an Absorb Plan to be used for the selected Trunk Group.

7.08 **CONTROL PLAN:** If this button is pressed any one of the 15 Control Plans in the Toll Control may be examined or defined. If the system is in Toll Control Trunk Group Programming the Control Plan may be used to assign a Control Plan to each COR of the selected Trunk Group.

7.09 **TABLE:** This button may be used to examine or modify a restriction table. The TABLE button may also be used to define exceptions or additions to Basic Conditions or Table entries of a Control Plan in Table entries.

7.10 **COR NUMBER:** This button, when pressed, allows the selection of a Class of Restriction within Toll Control Trunk Group Programming for a specific trunk group.

7.11 **BASIC CONDITION:** This button, when pressed, allows the selection of a Basic Condition number within Toll Control Trunk Group Programming.

7.12 **DISPLAY ENTRY:** This button allows the last entry by the programmer to be displayed.

7.13 **ABSORB REPEAT:** This button allows the Absorb Repeat digits of an Absorb Plan to be defined.

7.14 **ABSORB UNLOCK:** This button allows the Absorb Unlock digits of an Absorb Plan to be defined.

Buttons - Speed Call Extended Programming Mode

7.15 The following paragraphs describe the functions of the buttons which are used in the Speed Call Feature. The button designations are shown on the Extended Programming Overlay (Figure 6-2(d)).

7.16 **SPEED CALL:** Pressing this button allows the selection of the Speed Call program so that subsequent entries (below) are effective in programming the feature.

7.17 **TABLE:** After pressing this button, a Speed Call table number is dialed, to select number and a number redial facility, as described below.

7.18 **EQPT NUMBER:** Pressing this button and dialing an equipment number associates the equipment with the selected Speed Call Table.

7.19 **ACCESS NUMBER:** After a table has been selected, an entry access number may be assigned to it, by pressing the ACCESS NUMBER button and dialing a 2-digit number.

7.20 **NUMBER REDIAL:** Pressing this button after a table has been selected, enables a saved number redial facility to be associated with the table. This allows the station subsequently to store a Speed Call number which may be redialed when required.

Buttons - ARS Extended Programming Mode

7.21 The second and third row of console buttons assume different functions when the ARS button is pressed, while in the Extended Programming mode. These functions are shown in Figure 6-2(e).

7.22 **ARS:** Pressing this button allows the selection of the Automatic Route Selection program so that subsequent button functions (as described below) are effective.

7.23 **TABLE QTY:** The number of memory tables assigned for ARS is dependent upon the configuration number selected. After the configuration number has been assigned, the TABLE QTY button is pressed and the relevant digit (1, 2 or 3) is dialed.

7.24 **CODE TABLE:** This button is used to select a particular table by pressing the button and dialing the digits for the Table. After selecting the Table, the Area Code and Office Code digits can be entered for that Table.

7.25 **AREA CODE:** Pressing this button and dialing the 3-digit Area Code selects that Area Code, which may then be allocated to a particular Route Table.

7.26 **ROUTE TABLE:** This button is used to program specific routing information such as area and office codes and choice of routes to a particular Table.

7.27 **OFFICE CODE:** After the Code Table has been selected (see above), the 3-digit office codes to be allocated for the Table are entered, by pressing the OFFICE CODE button and dialing the required 3-digit office code.

7.28 **SCHED A, B AND C:** A 24-hour day may be separated into three distinct time periods (Schedules A, B and C) for least cost routing purposes. The prime period is set by pressing the SCHED A button and dialing the start and end times of the period. Schedule B is similarly allocated with SCHED B button. A time period is not dialed when SCHED C button is pressed, as the remainder of the 24-hour day is automatically assigned; the SCHED C button is used when assigning choice of routes.

7.29 **CHOICE NUMBER:** Up to four choices of routes may be selected within each of the foregoing Schedules. This is performed by pressing the CHOICE NUMBER button and dialing one of the digits 1 through 4. The route number is dialed after the choice is selected.

7.30 **ROUTE NUMBER:** This button is used when programming the Trunk Groups as route numbers. Pressing the ROUTE NUMBER button, followed by dialing the route number digit, allows the Trunk Group and "modify digits" data to be allotted to that route number.

7.31 **TRUNK GROUP:** Pressing this button, after the route number has been dialed, and then dialing the Trunk Group number allows this Trunk Group to be assigned the dialed route number.

7.32 **MODIFY DIGITS:** This button is used in conjunction with the DIGITS DELETE and DIGITS ADD buttons to create the proper routing digits for particular route number, irrespective of those inserted by the user.

7.33 **DIGITS DELETE:** This button is pressed to enable digits to be cancelled from the user's dialed routing digits. This is affected by pressing the button and dialing the numbers of digits to be deleted.

7.34 **DIGITS ADD:** In a manner similar to that for the DIGITS DELETE button, routing digits are added to the customer's dialed number. In this case however, after the button is pressed, the actual (not quantity) routing digits required are dialed.

7.35 **LOCAL AREA:** Pressing this button, and dialing the Local (Home) Area Code allows interchangeable office codes (i.e., NXX Office Codes) within the customer's area to be recognized.

Buttons – SUPERSET Extended Programming Mode

7.36 When programming the SUPERSET 3[or] SUPERSET 4 a console overlay different to the Standard and Extended overlays must be used. This overlay is shown in Figure 6-2(f), the system must be in the Extended Programming when using the overlay.

7.37 **LAMP TEST:** The LED associated with the LAMP TEST button will be lit steadily when the system is in the standard programming mode, and will flash when the system is in the extended programming mode. Pressing the LAMP TEST button while the switches on the Scanner card are set to 777X (where X is the console number 0-2) will put the system in the standard programming mode.

7.38 **SUPER SET:** The SUPER SET button selects the SUPERSET programming mode when the system is in extended programming. The SUPER SET button will be lit for the duration of SUPERSET programming.

7.39 **CANCEL:** Pressing the CANCEL button after making a data entry, will remove all new data from temporary storage, and allow new (correct) data to be entered.

7.40 **SET EQPT NUMBER:** Pressing this button allows the selection of the equipment number be programmed as a SUPERSET 4 equipment number.

7.41 **PRIME KEY:** The PRIME KEY button selects the prime line of the SUPERSET for programming. The prime key is always button number 1 on the SUPERSET 4. Every SUPERSET 4 must have one prime line, as the prime line access code is the SUPERSET extension number. The prime line (set) is accessed via an extension number unique to that set. A SUPERSET that has only a prime line programmed will operate as a standard telephone set as far as incoming and outgoing calls are concerned.

7.42 **SET KEY NUMBER:** The SET KEY NUMBER button allows selection of any non-prime key for programming. The numbers of keys for the SUPERSET 4 are 2-15 and for the SUPERSET 3 are 2 and 3.

7.43 **TRUNK EQPT NUMBER:** The TRUNK EQPT NUMBER allows the selection of a trunk equipment number to be used as a Direct Trunk Select (DTS) trunk or a private line trunk.

7.44 **NEW SET EQPT NUMBER:** The NEW SET EQPT NUMBER button allows the programmer to specify a new equipment number to move a SUPERSET to, rather than reprogram the SUPERSET.

7.45 **REVIEW:** The REVIEW button allows the programmer to observe all key line, multiple call and prime keys that have a specified directory number or all DTS and private line keys that have a specified trunk equipment number.

7.46 **ENTER:** The ENTER button transfers the entered data from the system temporary storage to the permanent non-volatile memory.

7.47 **ADD:** The ADD button enables 0/1 toll restriction on first or second digits 0, 1, ⁎, #. This type of control and Multi-Digit Toll Control are mutually exclusive.

7.48 **TYPE:** The type is a 1- to 4-digit number which represents a major type (the first digit) and any variants applicable to that major type (up to three digits). On the SUPERSET 4, keys 2-15 (non-prime keys) may be programmed for various functions. Key 1 is always the Prime key for the set and the remaining non-prime keys are numbered as increasing from bottom to top. There are five major types (of keys) that may be programmed for each of the 14 non-prime keys. Each non-prime key has a major type associated with it. If a key is not programmed to be one of these five major types, then the non-prime key is a SPEED CALL key (the speed call number is programmed from the SUPERSET itself). The six major types are:

(a) **KEY LINE:** Key Lines are "appearances" of a listed number in the system. The listed number may be that of a prime line or may only exist on the particular key. When one set seizes the line, all other appearances of that listed number are busy.

(b) **MULTIPLE CALL:** MULTIPLE CALL keys are also appearances of a listed number in the system. They are different from key line appearances in that while one appearance of the listed number may be busy, other appearances of that listed number will be idle.

(c) **DIRECT TRUNK SELECT:** The DIRECT TRUNK SELECT key is used to represent specified trunks. Each DTS key is assigned a trunk equipment number. DIRECT TRUNK SELECT keys may share the same trunk equipment number. When a shared DTS trunk is in use by one user in the system, all other DTS keys assigned to that trunk are busy.

(d) **PRIVATE LINE:** A Private Line is similar to a DTS line except that a Transfer/Conference cannot be performed.

(e) **PERSONAL OUTGOING LINE:** A Personal Outgoing Line is similar to a Multiple Call appearance of a prime key on a SUPERSET. It is considered to be an appearance of the set's prime line. Having this key guarantees that there is always at least one free line on the set (for an outgoing call) should all other lines be busy.

7.49 For a complete view of the TYPE options consult Table 7-1. When programming Multiple Call Line appearances, Type Options B, C and D must be programmed. When programming Direct Trunk Select and Private Line types, only Type Options B and C must be programmed. When programming a Personal Outgoing Line there are no variants. Key Line appearances require that B, C and the digit 1 be entered.

7.50 There is also a type number associated with the Prime key. This type number is used only when the key type is displayed in REVIEW mode and is never used when defining the key type, as Prime keys are programmed by themselves.

7.51 **LISTED NUMBER:** The LISTED NUMBER button specifies the access code of a SUPERSET's prime line and non-prime keys.

7.52 **COS NUMBER:** The COS NUMBER button assigns the COS to a specified set on a set.

7.53 **TOLL DENY:** The TOLL DENY button specifies whether the set is to be completely toll-allowed, subject to 0/1 dialing restriction or subject to multi-digit toll control (COR 1, 2, 3).

7.54 **BUSY LAMP NUMBER:** The BUSY LAMP NUMBER button specifies the busy lamp (1-200) to be associated with that SUPERSET.

7.55 **PICKUP GROUP:** The PICKUP GROUP button specifies the Pickup Group that the SUPERSET is to be in.

7.56 **ANNOUNCE EQPT #:** This button specifies the second port that will be used in conjunction with the SUPERSET as a call announcement line. This will require that the port is dedicated to this task and cannot be used for any other purpose.

7.57 **CONFIRM:** This button is used in a number of circumstances to confirm a requested action (usually an action that destroys existing programmed information).

7.58 **DELETE:** The DELETE button allows a deletion to be made to existing data and to specify a toll-allowed (unrestricted) set.

7.59 **NEXT:** The NEXT button allows the program to be reviewed by selecting the desired program, the desired starting point, then pressing the NEXT button to review the program. Pressing the NEXT button when the system initially enters the Standard Programming mode will place the system in the Extended Programming mode.

TABLE 7-1
TYPE OPTIONS

A TYPE (major)
• 1st digit: represents the line type for the key. 1 = PRIME KEY 2 = KEY LINE 3 = MULTIPLE CALL 4 = DIRECT TRUNK SELECT 5 = PRIVATE LINE 6 = PERSONAL OUTGOING LINE
B TYPE
• 2nd digit: represents the Direction Variant. 1 = BOTH WAY 2 = INCOMING ONLY 3 = OUTGOING ONLY
C TYPE
• 3rd digit: represents the Ring Variant. 1 = IMMEDIATE RING 2 = DELAYED RINGING 3 = NO RING
D TYPE
• 4th digit: represents the Secretarial Variant. 1 = NON-SECRETARIAL 2 = SECRETARIAL

SX-100®/SX-200®
SUPERSWITCH®
AUTOMATIC CALL DISTRIBUTION SYSTEM
TRAFFIC MEASUREMENT
GENERIC ACD

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1. GENERAL

Introduction

1.01 This Section describes the principles of obtaining telephone traffic measurement data and the various modes that can be employed to output this data. It also contains a description of the programming and operating procedures to obtain Traffic Measurement data for SX-100/SX-200 Automatic Call Distribution (ACD) Systems.

Reason for Issue

1.02 This Section has been issued to include the Generic ACD Traffic Measurement information.

1.03 The traffic measurement results may be examined to determine not only the adequacy of equipment provisioning, but also the effectiveness of programmed options and features. The results may thus be used to determine and implement changes to the system, by reprogramming and/or reprovisioning action to improve performance.

1.04 Traffic measurement accumulates data in the form of peg counts and usage data. Over a specified period of time, a peg count is the total number of times a device, service or feature is employed irrespective of its time duration. Usage usually implies the length of time or duration for which such a facility is used, but in certain applications it may only be required to know the peak value of the facility during the period (see 2.06).

1.05 The values are accumulated and stored in individual active registers, and the totals transferred to storage registers at the end of each hour, where they may be accessed from an RS232 port at any time during the next hourly period.

1.06 The active registers are zeroed after transferring their contents to the storage registers. The foregoing action is repeated for the period of the traffic measurement run, which has been set from the console.

Data Demultiplexer

1.07 In some situations it may be desirable to output various print-outs (Hotel/Motel, Maintenance, SMDR or Traffic Measurement) to different printing or recording devices. To do this a Data Demultiplexer must be employed. For information on the Data Demultiplexer see Section MITL9160-080-300-NA.

2. DATA ACCUMULATION METHODS

General

2.01 As outlined in 1.04, the total values of each device feature or service in the active registers, are transferred to storage registers. These registers may be printed or written to magnetic tape or a similar storage device, as desired.

Register Storage Methods

2.02 There are 170 traffic measurement registers provided. Each register, whether usage or peg count, takes 2 bytes of memory and is output as five ASCII digits. The type of data accumulated and its register number is contained in Table 2-1. This data appears under four major headings, as follows:

- System Services and Console Activity Data - indicating the extent of the activity of the basic system services (including console traffic activity).
- Features Data - indicating the activity of those features which have been programmed for the installation.
- Outgoing Trunk Group Peg Count and Usage Data.
- Incoming Trunk Peg Count and Usage Data.

2.03 Traffic measurement data is accumulated in 1 hour blocks. The start time and the run time are entered from the console. The start time may be specified to the nearest minute, and the run time is entered as the number of required hours. The basic 1 hour block time is invariable. Once set, and until changed, the traffic measurement run will occur at the same time each day. If the run is set for 24 hours, it will run continuously.

2.04 Referring to Figure 2-1 and considering Active Register 001, data is accumulated during the first hour (Block 1), and, at the end of that block, transferred to Storage Register 001 with the Active Register count reverting to zero. The data is held for 1 hour, during which time it may be accessed and is then replaced by the data count accumulated during Block 2 time. If the run time is less than 24 hours, the last block transferred will remain in the storage register up to 1 hour after the run commences the following day.

2.05 The foregoing method of transferring data values from the Active to the Storage Registers, is used in the Standard Mode method of operation. An exception to this data transfer method occurs under Extreme Value Mode operation. When this latter mode is used, the Active Register data value is only transferred if it exceeds the value held in the Storage Register (see 3.03) at the end of the hourly period.

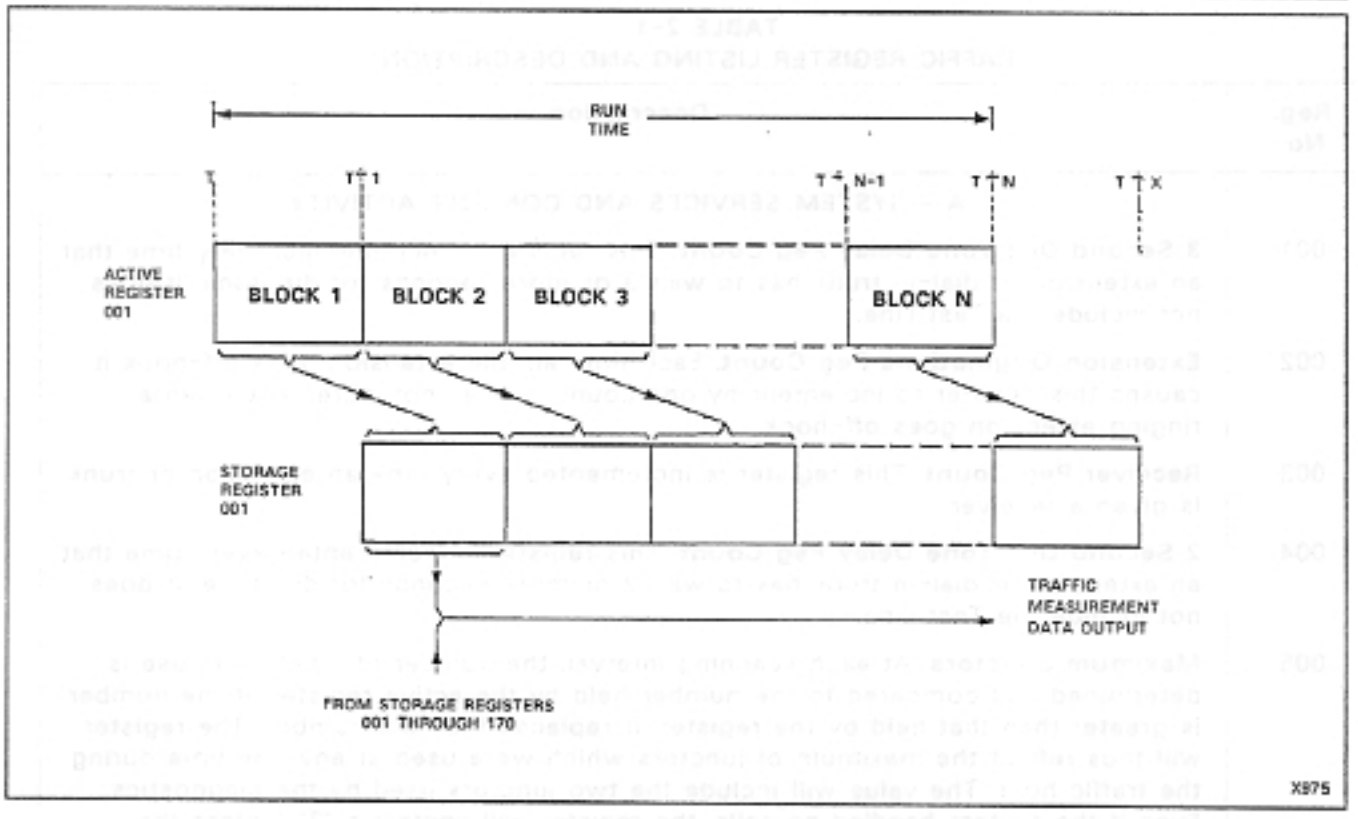


Figure 2-1 Traffic Measurement Collection and Output Diagram

Types of Register Counts

2.06 There are two basic types of data which are accumulated in the registers: peg counts and usage counts. Usage counts may be further divided into normal usage and maximum value usage counts, as outlined in the following subparagraphs:

(a) **Peg Counts:** Each time a device, service or feature is used, the Call Processing firmware causes the register to be incremented by one count. A peg count is not concerned with the time duration.

(b) **Normal Usage Count:** The period of time for which a device, service or feature is used may be calculated from the usage count. This is accomplished by the Call Processing firmware scanning the relevant circuit at 10 second intervals, and incrementing the register by one count if the circuit is in use. The time during which a circuit is in use is directly related to the usage count. Each accumulated usage count is converted in terms of ccs units (see Note) for the Standard Report format. This conversion is not done for the Compact Report format, as the data will be processed at a later date.

TABLE 2-1
TRAFFIC REGISTER LISTING AND DESCRIPTION

Reg. No.	Description
	A - SYSTEM SERVICES AND CONSOLE ACTIVITY
001	**3 Second Dial Tone Delay Peg Count.** This register is incremented every time that an extension or dial-in trunk has to wait 3 or more seconds for dial tone. It does not include the Test Line.
002	**Extension Originations Peg Count.** Each time an idle extension goes off-hook it causes this register to increment by one count. It does not increment when a ringing extension goes off-hook.
003	**Receiver Peg Count.** This register is incremented every time an extension or trunk is given a receiver.
004	**2 Second Dial Tone Delay Peg Count.** This register is incremented every time that an extension or dial-in trunk has to wait 2 or more seconds for dial tone. It does not include the Test Line.
005	**Maximum Junctors.** At each scanning interval, the number of junctors in use is determined and compared to the number held by the active register. If the number is greater than that held by the register, it replaces the held number. The register will thus reflect the maximum of junctors which were used at any one time during the traffic hour. The value will include the two junctors used by the diagnostics. Even if the system handled no calls, the register will contain a "2" (unless the system was in the programming mode).
006	**Junctor Usage.** At each scanning interval the number of junctors in use are added to the value contained in the register. At the end of the traffic hour the register will thus reflect the total usage of the junctors during the period. It includes the use of junctors by the diagnostic and thus will not be zero even if the system handled no calls during the period.
007	**1 Second Dial Tone Delay Peg Count.** This register is incremented every time an extension or dial-in trunk has to wait 1 or more seconds for dial tone. It does not include the Test Line.
008	**Vacant/Illegal Calls Peg Count.** This register increments whenever an extension, the supervisor or a dial-in trunk dials a vacant or illegal number. It increments regardless of whether intercept to supervisor or Reorder Tone occurs.
009	**System Activity Peg Count.** Each time a line or trunk card interrupt is processed, or a timer expires, this register increments. It thus provides a relative measure of system activity to determine the busiest hour during a Traffic Measurement run.
010	**Calls Waiting Usage.** At each scan the number of calls waiting in the supervisor queue is added to the register. The hourly accumulation represents the occupancy of calls waiting (in ccs).
011	**Calls to Supervisor Peg Count.** This register contains a count of all calls directed to the supervisor. It includes calls that hang up before they are answered. The register total will not be the sum of the following register totals because abandoned calls are not included.
012	**LDN 1 Peg Count.** This register is incremented for each incoming LDN (Local Directory Number) 1 call answered by the supervisor.

TABLE 2-1 (CONT'D)
TRAFFIC REGISTER LISTING AND DESCRIPTION

Reg. No.	Description
013	**Console 1 Busy Usage.** This register records the length of time during the hour for which the console was in use. "In use" means the supervisor was dialing or had a Source or Destination or both. It does not include any time for which the supervisor had a call on hold.
014	**Dial 0 Peg Count.** This register increments every time the supervisor answers a "Dial 0" call. It includes Intercepts, for which a separate count is maintained. It also includes Manual Lines and Contact Monitors.
015	**LDN 2 Peg Count.** This register is incremented for each Incoming LDN 2 call answered by the supervisor.
016	**Console 2 Busy Usage.** This register records the length of time during the hour for which the console was in use. "In use" means the supervisor was dialing or had a Source or Destination or both. It does not include any time for which the supervisor had a call on hold.
017	**Recall Peg Count.** This register is incremented for each Recall answered by the supervisor. This includes Serial and Callback Recalls.
018	**LDN 3 Peg Count.** This register is incremented for each Incoming LDN 3 call answered by the supervisor.
019	**Supervisor-Originated Calls Peg Count.** This register is incremented each time the supervisor makes a call, whether the supervisor has a Source or not. It is incremented even if the supervisor receives Busy or Reorder Tone.
020	**Intercept Peg Count.** This count is incremented for each Intercept answered by the supervisor.
021	**LDN 4 Peg Count.** This register is incremented for each Incoming LDN 4 call answered by the supervisor.
	B – FEATURES
022	Spare Register
023	Spare Register
024	Spare Register
025	**TAFAS Peg Count.** This register is incremented when a TAFAS code is dialed, even when busy tone is received.
026	**Override Peg Count.** This register is incremented whenever an extension dials the Executive Busy Override code or the supervisor presses the OVERRIDE button. It only increments when the override is completed.
027	**Call Pickup Peg Count.** This register is incremented whenever one of the Dial or Directed Call Pickup codes is legally dialed.
028	**Maid in Room Peg Count.** This register is incremented whenever the Maid Room status is updated.

TABLE 2-1 (CONT'D)
TRAFFIC REGISTER LISTING AND DESCRIPTION

Reg. No.	Description
029	**Paging Peg Count.** This register is incremented when an extension, dial-in trunk or the supervisor dials one of the three Paging codes and when the supervisor presses the PAGE button. Illegal accesses are excluded.
030	**Supervisor Conference Peg Count.** This register is incremented whenever the supervisor presses the CONF button to set up a new conference.
031	**Hold Pickup Peg Count.** This register is incremented when the Hold Pickup code is legally dialed.
032	**Call Forward Peg Count.** This register is incremented whenever an extension dials one of the four Call Forwarding codes to set up forwarding. It is also incremented when the supervisor sets up forwarding on behalf of an extension.
033	**Extension Wake-Up Peg Count.** This register is incremented whenever an extension uses the Extension Wake-Up facility.
034	**Supervisor Hold Peg Count.** This register is incremented whenever the supervisor puts a party on Hold.
035	**Station-Controlled Conference Peg Count.** This register is incremented whenever an extension flashes to add someone to a conversation that already has two other parties.
036	**Do Not Disturb Peg Count.** This register is incremented when the supervisor sets up Do Not Disturb for a room. It is also incremented if the room dials the Room Do Not Disturb setup code.
037	**Camp-On Peg Count.** This register is incremented whenever an extension or trunk is camped onto another extension or a Trunk Group.
038	**Call Hold Peg Count.** This register is incremented whenever an extension dials the Call Hold code.
039	**Meet-Me Conference Peg Count.** This register is incremented when an extension or dial-in trunk dials the Meet-Me Conference code.
040	**Serial Call Peg Count.** This register is incremented whenever the supervisor uses the Serial Call button.
041	**Callback Peg Count.** This register is incremented whenever an extension successfully dials the Callback - Busy or Callback - Don't Answer code, or the supervisor presses the CALLBACK button.
042	**Call Park Peg Count.** This register is incremented when the Call Park code is dialed.
043	**Flash and Hold Peg Count.** This register is incremented whenever an extension flashes and puts another party on Hold.

TABLE 2-1 (CONT'D)
TRAFFIC REGISTER LISTING AND DESCRIPTION

Reg. No.	Description
	C - OUTGOING TRUNK GROUPS
	CAUTION: Since the system only records traffic data for 40 trunks, the Trunk Group Usage may be incomplete if the system has more than 40 trunks.
045 through 056	**Trunk Group Peg Count.** This register is incremented every time someone dials the group's access code, even if the caller receives busy tone. It also increments when a busy overflow occurs from another group into this one. It does not increment if the access is illegal or if the group is "supervisor access only" and the caller is not the supervisor. Each of the 12 Trunk Groups is respectively allotted to the 12 registers 045 through 056.
057 through 068	**Trunk Group Usage.** If any trunk in the group is found to be in use outgoing when it is scanned, this register is incremented. The hourly total thus reflects the duration of usage. Each of the 12 Trunk Groups is respectively allotted to the 12 registers 057 through 068.
069 through 080	**Trunk Group Busy/Overflow Peg Count.** This register is incremented every time someone dials the access code and all trunks in the group are busy. Each of the 12 Trunk Groups is respectively allotted to the 12 registers 069 through 080.
081 through 090	**Trunk Group Supervisor Busy-Out Usage.** If the Trunk group has been made "supervisor access only" when it is scanned, this register is incremented. The hourly total thus reflects the duration of usage. Each of the first 10 Trunk Groups is respectively allotted to the 10 registers 081 through 090.
	D - INCOMING TRUNKS
	TRUNK DATA (Note: Traffic data is accumulated for a maximum of 40 trunks. The system assigns the first 40 equipment numbers programmed as trunks at the beginning of each hour.)
091 through 130	**Trunk Incoming Peg Count.** This register is incremented each time a trunk is seized incoming. Each of the 40 trunks is respectively allotted to the 40 registers 091 through 130.
131 through 170	**Trunk Incoming Usage.** If a trunk is in use incoming when it is scanned, this register is incremented. Each of the 40 trunks is respectively allotted to the 40 registers 131 through 170.
	Note: If a trunk is "Busied-Out" when it is scanned, the Incoming Usage is reported as "~~xxxxx~~" in the Standard Report and as "99999" in the Compact Report (see Figure 3-1 and Figure 3-2)

(c) **Maximum Value Usage Count:** This type of usage count is obtained in a similar manner to that outlined in (b) above, except for the method of register entry. The value obtained at each scan does not increment the register. Instead the value obtained is compared with the register value and is only entered if its value exceeds that in the register. The register value will thus reflect, at the end of the hourly period, the maximum or peak value of usage, and not total usage.

Note: A call which lasts for 100 seconds is said to have a value of 1 ccs (hundred-call-seconds). For example, a "usage count" total of 128 represents 1280 seconds of usage, equivalent to 12.8 ccs (36 ccs is equivalent to 1 Erlang).

Register Count Examples

2.07 The following examples respectively illustrate these "count" methods. The register descriptions are abstracted from Table 2-1.

(a) **Register 002** (Extension Originations Peg Count). Each time an idle extension goes off-hook, it causes the register to increment by one count. Thus, it is a measure of the number of calls originated by the extension. It does not increment when a ringing extension goes off-hook. Table 3-1 as an example, shows this register to have a value of 858; i.e., the call originations (or off-hook originations) during the period totalled 858.

(b) **Register 006** (Junctor Usage). At each scanning interval the number of junctors in use is added to the value contained in the register. At the end of the traffic hour, the register will thus reflect the total usage of the junctors during the period. It includes the use of junctors by the diagnostic, and thus will not be zero even if the system handled no calls during the period. Table 3-1 shows an example value of 570; i.e., the occupancy time for all junctors used during the period totaled 570 ccs traffic units.

(c) **Register 005** (Maximum Junctors). At each scanning interval the number of junctors in use is determined and compared to the number held by the active register. If the number is greater than that held by the register, it replaces the held number. The register will thus reflect the maximum of junctors which were used at any one time during the traffic hour. The value will include the two junctors used by the diagnostics. Even if the system handled no calls the register will contain a "2" (unless the system was in the programming mode). The example in Table 3-1 indicates that during the period a peak or maximum number of 22 junctors was in use at some particular instant.

Output Methods

2.08 The traffic measurement data can be obtained in different modes and formats, and output to a local or remote terminal. These are discussed in Part 3.

Multiple Consoles

2.09 Separate counts are not maintained if there are two consoles, except in the case of the two "console busy usage" registers, which are individually incremented whenever the particular console is not idle. All other registers include activity on both consoles.

Register Data Descriptions

2.10 Table 2-1 details the storage registers used, and describes the type of output obtained from each one, under the major headings of:

- System Services and Console Activity
- Features
- Outgoing Trunk Groups
- Incoming Trunks.

Additional Data Information

2.11 In addition to the data supplied by the Traffic Measurement reports (Part 3), certain data can be obtained as outlined below:

(a) **Calls Answered Peg Count.** The total number of calls answered by the supervisor is obtained as the sum of Registers 012 (LDN 1), 014 (Dial 0), 015 (LDN 2), 017 (Recall), 018 (LDN 3) and 021 (LDN 4).

(b) **Abandoned Calls Peg Count.** The number of abandoned calls to the supervisor is the difference between Registers 011 (Calls to Supervisor) and the preceding "Calls Answered Peg Count".

(c) **Average Speed of Answer.** The average speed of answer by the supervisor may be calculated from Registers 011 (Call to Supervisor) and 010 (Calls Waiting).

2.12 The following information is provided to clarify the data provided by Trunk Group overflow conditions. As an example, it is assumed that Trunk Group A has overflow to Trunk Group B, and that Trunk Group B has no overflow. Trunk Group A is now accessed and the following conditions can occur:

(a) If all trunks in group A are not busy, then Trunk Group A peg count is incremented.

(b) If all trunks in group A are busy but not all trunks in group B are busy, then both Trunk Group A and Trunk Group B peg counts

are incremented. In addition, group A's busy/overflow peg count is incremented.

(c) If all trunks in group A and B are busy, the Trunk Group peg counts and the busy/overflow peg counts of both groups are incremented.

3. TRAFFIC MEASUREMENT MODES AND REPORTS

General

3.01 Traffic data is collected as described in Part 2, and its output is dependent on the particular system options selected and programmed on site. Figure 3-1 illustrates the results of selecting these options, which are described in the following paragraphs.

Standard Mode Collection

3.02 Standard Mode collection is described in 2.04 and illustrated in Figure 2-1. It represents the method of collecting data on active registers, and replacing the contents of the storage registers at the end of the hourly run with the new active register values.

Extreme Value Mode Collection

3.03 Extreme Value Mode collection is basically similar to the Standard Mode collection (2.05), except that a particular active register's contents are only transferred to the storage register if it exceeds the value contained in the storage register. Upon the termination of a Traffic Measurement run, the individual storage outputs will thus reflect the hourly peak readings obtained during the run.

3.04 The following points should also be noted with regard to differences between the Standard and Extreme Value Modes:

(a) In the case of Standard Mode, the storage registers may be interrogated for their content value at the end of a Traffic Measurement run, and up until 1 hour after the commencement of a subsequent Traffic Measurement run. However, for the Extreme Value Mode, the registers may only be interrogated up until the commencement of the subsequent Traffic Measurement run, as they are zeroed at this point (but see below).

(b) In the Extreme Value Mode, if Traffic Measurement is running continuously, the storage registers are not zeroed at the start of the run and the maximum may be accumulated over several days.

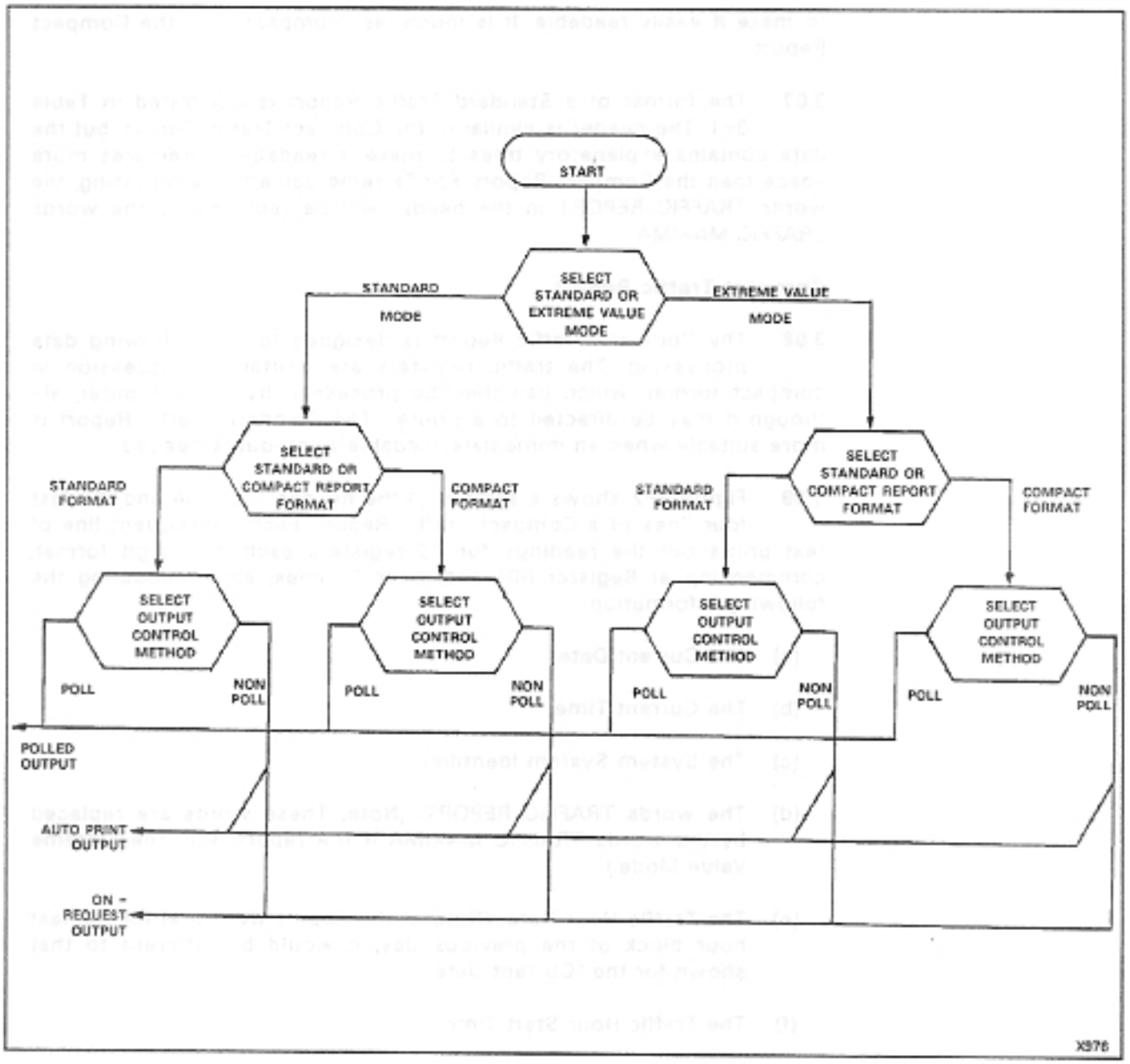


Figure 3-1 Types of Data Output

Output Formats

3.05 Two types of output formats are possible, as under:

- Standard Traffic Report, and
- Compact Traffic Report.

Standard Traffic Report

3.06 The Standard Traffic Report is intended for the user who wants to work with the traffic data as output by the System without processing it first. It is in the form of a report with headings and text

to make it easily readable. It is much less compact than the Compact Report.

3.07 The format of a Standard Traffic Report is illustrated in Table 3-1. The header is similar in the Compact Traffic Report, but the data contains explanatory titles to make it readable. It requires more space than the Compact Report. For Extreme Value Mode reporting, the words TRAFFIC REPORT in the header will be replaced by the words TRAFFIC MAXIMA.

Compact Traffic Report

3.08 The Compact Traffic Report is designed for the following data processing. The traffic registers are written in succession in compact format, which can then be processed by the computer, although it may be directed to a printer. The Standard Traffic Report is more suitable when an immediate readable print-out is needed.

3.09 Figure 3-2 shows a sample of the header, first line and the last four lines of a Compact Traffic Report. Each subsequent line of text prints out the readings for 10 registers each in 5-digit format, commencing at Register 001 and, over 17 lines, accommodating the following information:

(a) The Current Date.

(b) The Current Time.

(c) The System System Identifier.

(d) The words TRAFFIC REPORT. (Note: These words are replaced by the words TRAFFIC MAXIMA if the report is in the Extreme Value Mode.)

(e) The Traffic Hour Date. (Note: If this report were that for the last hour block of the previous day, it would be different to that shown for the "Current Date".)

(f) The Traffic Hour Start Time.

(g) The End of Traffic Hour Time.

3.10 It should be noted that the usage values shown in the Standard Report are output in ccs units. In the Compact Report the usage values are in 10 second units.

3.11 Actual format details for the purpose of processing a Compact Traffic Report are contained in the following Tables:

(a) Table 3-2 details the Header format. This header is the same for the Compact and Standard Reports.

(b) Table 3-3 details the format for the traffic register details.

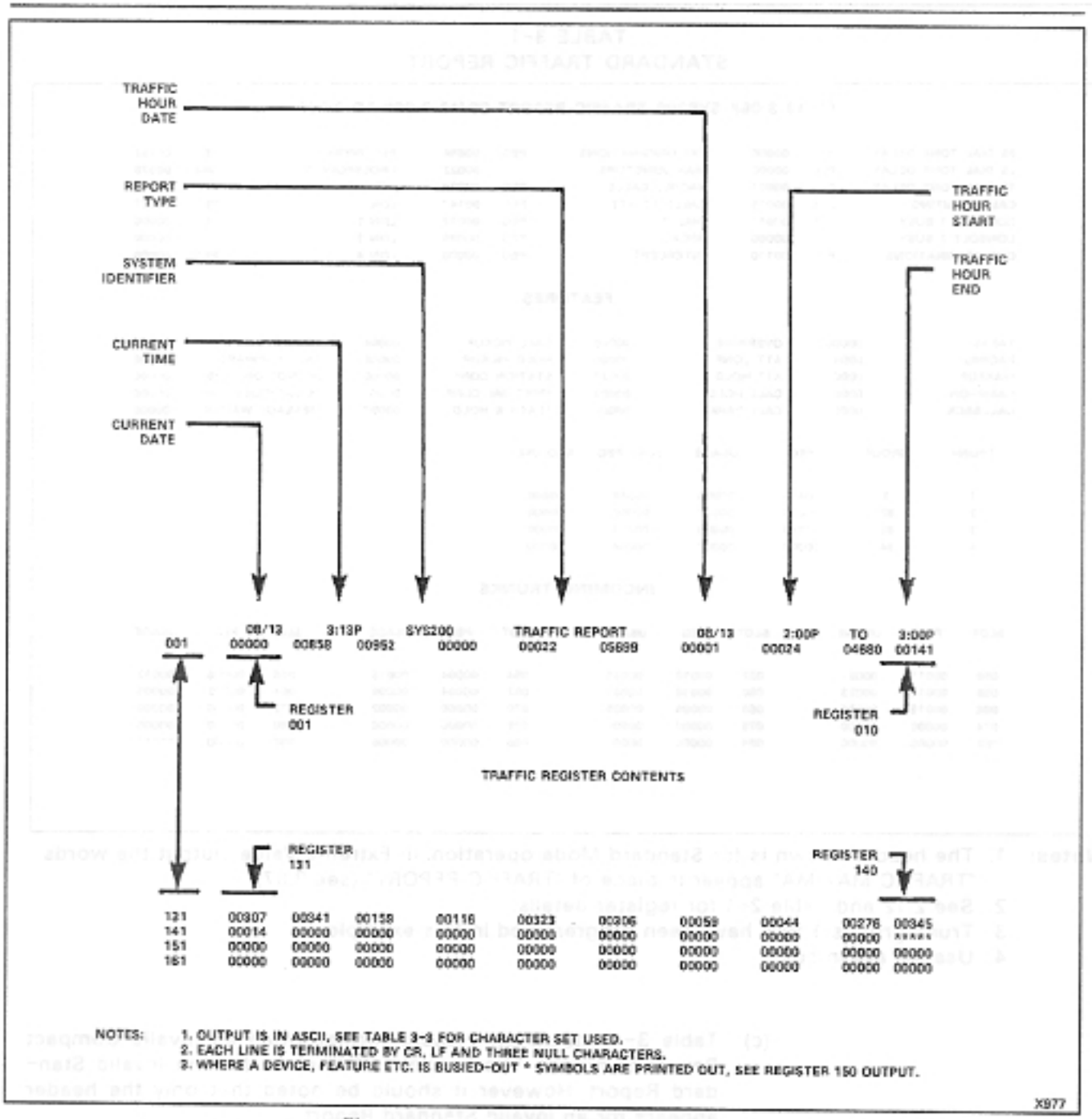


Figure 3-2 Compact Traffic Report

TABLE 3-1
STANDARD TRAFFIC REPORT

08/13 3:06P SYS200 TRAFFIC REPORT 08/13 2:00P TO 3:00P

3S DIAL TONE DELAY	PEG	00000	EXT ORIGINATIONS	PEG	00058	RECEIVERS	PEG	00052
2S DIAL TONE DELAY	PEG	00000	MAX JUNCTORS	---	00022	CROSSPOINTS	USE	00570
1S DIAL TONE DELAY	PEG	00001	VAC/ILL CALLS	PEG	00024	ACTIVITY	PEG	04680
CALLS WAITING	USE	00015	CALLS TO ATT	PEG	00147	LDN 1	PEG	00087
CONSOLE 1 BUSY	USE	00017	DIAL 0	PEG	00033	LDN 2	PEG	00000
CONSOLE 2 BUSY	USE	00000	RECALL	PEG	00020	LDN 3	PEG	00000
OPR ORIGINATIONS	PEG	00110	INTERCEPT	PEG	00000	LDN 4	PEG	00000

FEATURES

TAFAS	00000	OVERRIDE	00000	CALL PICKUP	00004	MAID IN ROOM	00000
PAGING	00042	ATT CONF	00000	HOLD PICKUP	00008	CALL FORWARD	00000
WAKEUP	00001	ATT HOLD	00031	STATION CONF	00000	DO NOT DISTURB	00000
CAMP-ON	00025	CALL HOLD	00003	MEET-ME CONF	00007	SERIAL/GUEST RM	00000
CALLBACK	00059	CALL PARK	00000	FLASH & HOLD	00037	MESSAGE WAITING	00000

TRUNK	GROUP	PEG	USAGE	BUSY PEG	AAO USE
1	9	00416	00095	00348	00000
2	B2	00055	00073	00000	00000
3	B3	00265	00080	00218	00000
4	B4	00006	00002	00004	00000

INCOMING TRUNKS

SLOT	PEG	USAGE	SLOT	PEG	USAGE	SLOT	PEG	USAGE	SLOT	PEG	USAGE
050	00011	00031	052	00010	00035	054	00004	00016	056	00005	00012
058	00014	00033	060	00018	00031	062	00004	00006	064	00002	00005
066	00015	00028	068	00005	00035	070	00000	00002	072	00000	00000
074	00000	00000	076	00000	00000	078	00000	00000	080	00000	00000
082	00000	00000	084	00000	00000	086	00000	00000	088	00000	*****

Notes:
1. The header shown is for Standard Mode operation. In Extreme Value Output the words "TRAFFIC MAXIMA" appear in place of "TRAFFIC REPORT" (see 3.07).
2. See 2.12 and Table 2-1 for register details.
3. Trunk groups 1 to 4 have been programmed in this example.
4. Usages are in ccs.

(c) Table 3-4 shows the Header format when an Invalid Compact Report is output. The header is the same for the Invalid Standard Report. However it should be noted that only the header appears for an Invalid Standard Report.

Invalid Output Format

3.12 If a power failure occurs during a traffic hour, the registers are zeroed. A special header's record is sent so that the user can disregard that hour's data. An example of an Invalid Compact Report is shown in Table 3-5. An Invalid Standard Report is identical to that for an Invalid Compact Report, except that only the header is printed out.

3.13 After a restart, the time on the console will be "00:00" and will flash to say that it is not valid. If traffic is polled, the current time will be "00:00".

4. OUTPUT CONFIGURATION

General

4.01 Figure 4-1 shows the external connections to the System data port connector J302. The port may be connected via an RS232 Adapter either to an external modem for the remote polling facility or to a local terminal (printer). Both types of connections cannot be simultaneously employed.

Output Control

4.02 Traffic output may be controlled in one of three ways:

- By polling from an external device.
- By specifying that the data be printed automatically every hour (Autoprint).
- By requesting output from the console via an supervisor function.

External Polling Mode

4.03 The polling mode of operation allows an external device to poll the System and request that traffic data be output to it. The device sends control characters to the System via the RS232 port to enable or suspend the output. Other types of print-outs (e.g., Message Registration Printing) cannot be obtained in the polling mode.

Autoprint Mode

4.04 As an alternative to the Polling mode, the hourly print-out may be output automatically (Autoprint). The Polling mode and Autoprint mode cannot be simultaneously enabled (see Figure 3-1 and Table 6-2).

Console-Controlled Outputs

4.05 Traffic measurement data may be printed on request from the console if the Polling mode is not selected. Part 6 details the required operation. This data may be obtained at any time except under the following conditions:

(a) Print-outs cannot be requested if the Polling mode has been selected.

(b) If Autoprint mode has been enabled and the System is in the process of printing a Traffic Report at the time a Hotel/Motel print-out is requested, the latter print-out will not occur until completion of the Autoprint print-out.

TABLE 3-2
REPORT HEADER FORMAT

Columns	Format	Description	Notes
1-3	------	Record Identifier	-- = Space
4-5	----	Spacer	-- = Space
6-10	mm/dd/yy	Current Date	mm = Month, dd = Day yy = year
11	--	Spacer	-- = Space
12-17	hh:mmp	Current Time	hh = Hours, mm = Minutes p = P(PM), = --(AM) or 24-hour clock
18-21	--SYS	System ID Message	Text
22-24	nnn	System ID	nnn = 000 (no ID), = 001 - 999 (Assigned ID)
25-26	----	Spacer	-- = Space
27-40	TRAFFIC REPORT OR	Traffic Header Message OR	Text
27-40	TRAFFIC MAXIMA	Header in Extreme Value Mode	
41-42	----	Spacer	-- = Space
43-47	mm/dd	Date of Traffic Hour	mm = Month, dd = Day
48	--	Spacer	-- = Space
49-54	hh:mmp	Start of Traffic Hour	hh = Hours, mm = Minutes p = P(PM), = --(AM) or 24-hour clock
55-58	--TO--	Hour Separator	Text (Note 3)
59-64	hh:mmp	End of Traffic Hour	hh = Hours, mm = Minutes p = P(PM), = (AM) or 24-hour clock (Note 3)

Notes:
1. The header is the same for the Standard Report and the Compact.
2. See Table 3-1 for example of Standard Report, and Figure 3-2 for Compact Report example.
3. If traffic data collecting equipment (similar to Alston 724) needs a specific character string to be defined to identify a traffic report, columns 55-61 are recommended for this purpose.

TABLE 3-3
COMPACT REPORT REGISTER DETAILS

Columns	Format	Description	Notes
1-3	rrr	Traffic Register Number	See Table 2-1 (001 by 10 per line)
4	--	Spacer	-- = Space
5-10	--nnnnn	Contents of Register rrr preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
11-16	--nnnnn	Contents of Register rrr + 1 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
17-22	--nnnnn	Contents of Register rrr + 2 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
23-28	--nnnnn	Contents of Register rrr + 3 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
29-34	--nnnnn	Contents of Register rrr + 4 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
35-40	--nnnnn	Contents of Register rrr + 5 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
41-46	--nnnnn	Contents of Register rrr + 6 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
47-52	--nnnnn	Contents of Register rrr + 7 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
53-58	--nnnnn	Contents of Register rrr + 8 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk
59-64	--nnnnn	Contents of Register rrr + 9 preceded by a space	00000 to 65535 Decimal 99999 Busied-out trunk

Note: See Table 3-2 for Header Detail and Figure 3-2 for example of report.

TABLE 3-4
INVALID HEADER FORMAT

Columns	Format	Description	Notes
1-3	***	Invalid Report Identifier	Identifies invalid report
4-5	----	Spacer	-- = Space
6-10	mm/dd	Current Date	mm = Month, dd = Day
11	--	Spacer	-- = Space
12-17	hh:mmp	Current Time	hh = Hours, mm = Minutes p = P(PM), = --(AM) or 24-hour clock
18-21	--SYS	System ID Message	Text
22-24	nnn	System ID	nnn = 000(No ID), = 001 - 999 (Assigned ID)
25-26	----	Spacer	-- = Space
27-40	TRAFFIC-- REPORT	Traffic Header Message	Text
41-42	----	Spacer	-- = Spacer
43-59	----Not-- -Available- ----	Registers Invalid Message	Text
60-61	----	Spacer	-- = Space
62-64	***	Invalid Report Identifier	

Notes: 1. The header is the same for the Standard Report and the Compact Report.
2. See Table 3-5 for an example of a report.

TABLE 3-5
INVALID COMPACT REPORT

***	01/17	15:04		TRAFFIC REPORT			NOT AVAILABLE			***
001	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
011	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
021	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
031	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
041	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
051	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
061	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
071	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
081	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
091	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
101	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
111	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
121	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
131	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
141	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
151	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000
161	00000	00000	00000	00000	00000	00000	00000	00000	00000	00000

Notes: 1. See 3.10 and 3.11 for explanation.
2. An Invalid Standard Report has an identical header line, but the register numbers and contents do not appear below the header.

Printer Requirements

4.06 The speed of the data transmission can be switch-selected at the System for 300 or 1200 baud ASCII code with odd parity. A line length of 80 characters is used for the Standard Report and 64 lines for the Compact Report. The print-out of each line is terminated by a "CR" (carriage return) and "LF" (line feed) character, followed by six NULL characters if System Option 207 has been selected. The Standard Traffic Report (Table 3-1), is preceded by an "FF" (form feed) character before being output. These function characters (non-printing) are not included in the line length. The subset of required ASCII characters are shown in Table 4-1.

4.07 If the printer characteristics require a delay before the next line is to be printed, this can be provided by enabling System Option 207. This causes six "NULL" (non-printing) characters to be transmitted immediately following the "carriage return" and "line feed" characters. If this option is not selected, no "nulls" are sent.

4.08 For ordering information, see Section MITL9105/9110-090-150-NA.

5. INSTALLATION

General

5.01 Installation to meet the Traffic Measurement requirements consists of the following steps:

(a) Verification that Generic ACD software is included in the SX-100/SX-200 System.

TABLE 4-1
CHARACTER SET

BIT NUMBERS												
								0	0	0	0	1	1
								0	0	1	1	0	0
								0	1	0	1	0	1
b_7	b_6	b_5	b_4	b_3	b_2	b_1	COLUMN / ROW	0	1	2	3	4	5
			0	0	0	0	0	NUL		SP	0		P
			0	0	0	1	1		DC1	!	1	A	Q
			0	0	1	0	2			"	2	B	R
			0	0	1	1	3		DC3	#	3	C	S
			0	1	0	0	4				4	D	T
			0	1	0	1	5			%	5	E	U
			0	1	1	0	6			&	6	F	V
			0	1	1	1	7	BELL		/	7	G	W
			1	0	0	0	8			(	8	H	X
			1	0	0	1	9			)	9	I	Y
			1	0	1	0	A	LF		*	:	J	Z
			1	0	1	1	B			+	;	K	
			1	1	0	0	C	FF		,		L	
			1	1	0	1	D	CR		–	=	M	
			1	1	1	0	E			.		N	
			1	1	1	1	F			/	?	0	

Notes: 1. Control DC1 or a "BREAK" or NULL causes printing.
2. Control DC3 suspends printer.

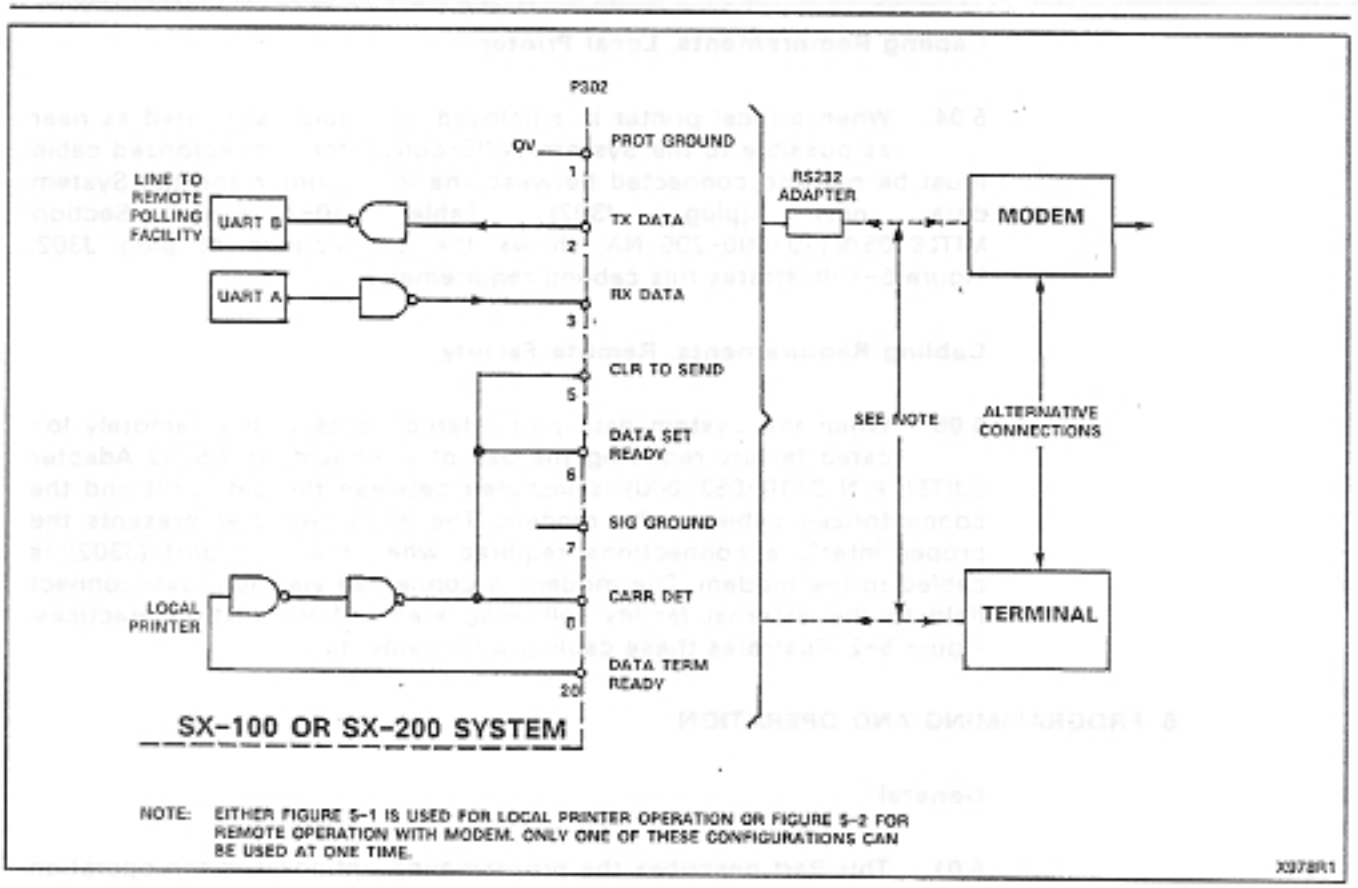


Figure 4-1 Alternative Configurations – System Data Port

(b) Determination of the required mode (see Figure 3-1).

(c) Determination of the required output configuration (see Figure 4-1).

(d) Installing the hardware items.

(e) Programming and operation of the completed installation.

5.02 The installation of the required hardware items are discussed in the following paragraphs. Part 6 should be referred to for programming and operation of the completed system.

Cabling and Cross-Connections

5.03 Section MITL9105/9110-090-200-NA details the installation of SX-100/SX-200 System. Parts 9 (Installation Requirements) and 10 (Cabling and Cross-Connections) of the above-mentioned Section show the procedures to be used, and should be consulted in conjunction with the following paragraphs.

Cabling Requirements, Local Printer

5.04 When a local printer is employed, it should be located as near as possible to the System. A 25-conductor connectorized cable must be run and connected between the local printer and the System data port (plug J302). Table 10-2 of Section MITL9105/9110-090-200-NA shows the connections of plug J302. Figure 5-1 illustrates this cabling requirement.

Cabling Requirements, Remote Facility

5.05 When the System data port interconnects with a remotely located facility requiring the use of a modem, an RS232 Adapter (MITEL P/N 9110-052-000) is installed between the data port and the connectorized cable to the modem. The RS232 Adapter presents the proper interface connections required when the data port (J302) is cabled to the modem. The modem is connected via the cross-connect field to the external facility following standard installation practices. Figure 5-2 illustrates these cabling arrangements.

6. PROGRAMMING AND OPERATION

General

6.01 This Part describes the programming options and the operation of the utilities required in connection with traffic measurements.

6.02 Traffic Measurement data may be obtained in various modes and formats as outlined in Part 3. These modes and formats are dependent on actual requirements as outlined below (see Figure 3-1):

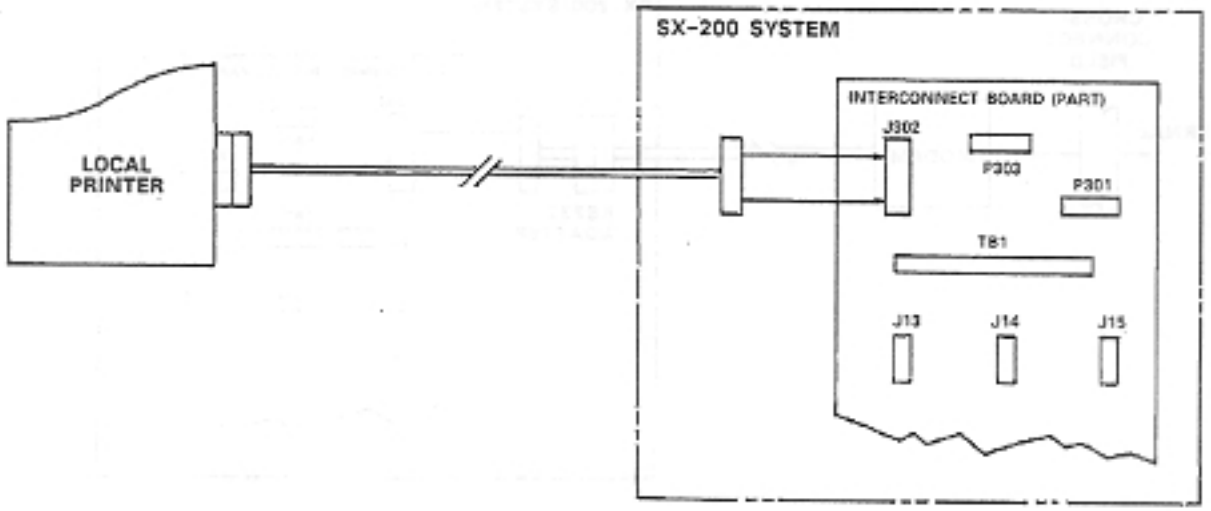
(a) **Polling Mode.** The System may be polled by an external Agency at prescribed intervals, with the data obtained being in the form of a Standard or Extreme Value Mode, and either as a Standard or Compact Traffic Report.

(b) **Autoprint Mode.** The System may automatically output the traffic data at regular hourly intervals to an external Agency. Alternately this mode may be employed with the local printer.

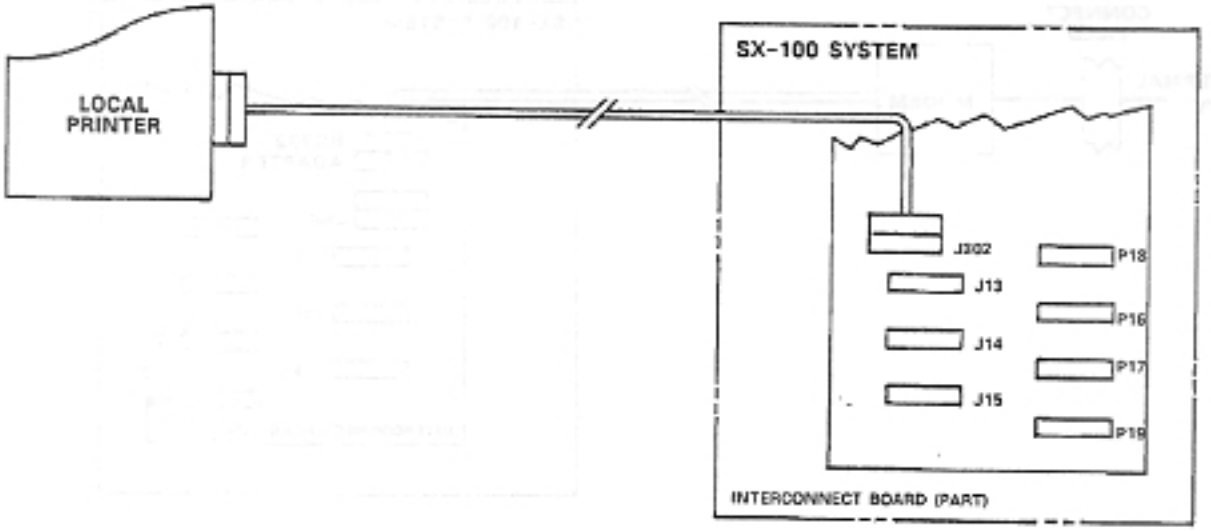
(c) The same type of data output may be called up from the System console to a local printer.

Programming

6.03 Telephone Company Traffic personnel and users may select and perform measurements in the variety of modes and formats outlined above, with the flexibility of changing these modes and formats to meet changing requirements.



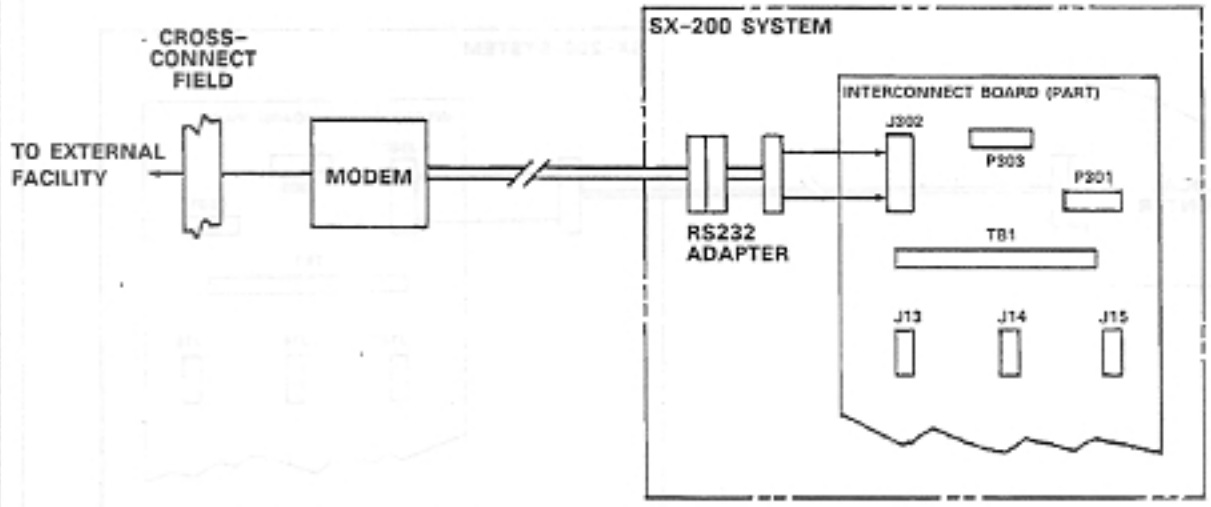
(A) CABLING FOR SX-200 DATA PORT



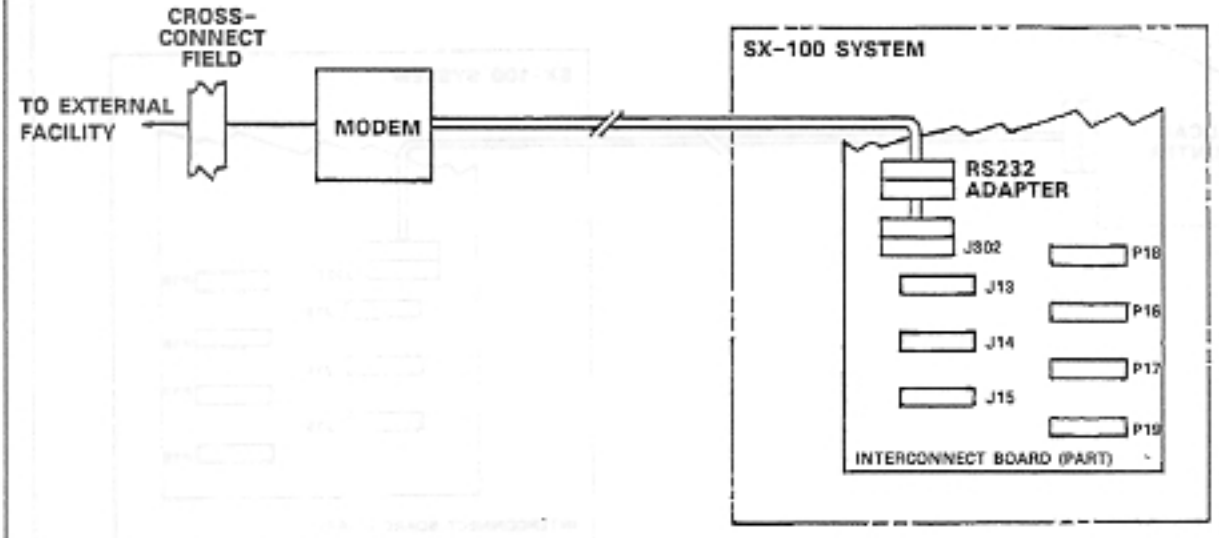
(B) CABLING FOR SX-100 DATA PORT

X1294R1

Figure 5-1 Cabling to Local Printer



(A) CABLING FOR SX-200 DATA PORT



(B) CABLING FOR SX-100 DATA PORT

X1255R1

Figure 5-2 Cabling to Remote Printer

6.04 Programming of the System to enable required features and options is performed at the time of installation. Other features and options may be subsequently entered, if required, to modify the facilities. The procedures are outlined in the following Sections:

- Volume 3 Installation Forms
- Section MITL9105/9110-090-210-NA, System Programming

6.05 Where traffic measurement is a requirement, the relevant options are entered in the same manner as for the options mentioned in the above Sections. The type of traffic measurement options required should be determined from paragraph 6.02 and implemented as noted in the following paragraphs.

6.06 Table 6-1 lists the Traffic Measurement System Options. Option 298 must be enabled for the traffic measurement feature. The remaining options listed in Table 6-1 are then enabled as required, but note that certain Hotel/Motel print-out System Options cannot be enabled if System Option 300 (Polling) is selected. The reason is that when a local printer is used for print-outs, the System data port cannot be used for the polling function. This and other conflicts are listed in Table 6-2.

Remote Operation

6.07 When the required System Options have been entered in the System, the necessary operations to obtain traffic measurement data at the remote location are as follows:

(a) **Polling Mode.** To request traffic data, the character DC1 or NULL is transmitted from the remote terminal to the System data port. The NULL code also results when a BREAK is sent from the remote equipment. Hence a BREAK may be used to initiate polling. These characters are ignored while in the middle of outputting a report. On receipt of any one of these signals, traffic data will then be transmitted from the System to the remote device over the line. To suspend the flow of traffic data, the character DC3 is sent from the remote terminal. This will immediately suspend the traffic data flow. Traffic data flow may be resumed by transmittal of character DC1.

(b) **Autoprint Mode.** If System Option 295 (Autoprint) is selected, hourly traffic measurement data is transmitted automatically from the System data port. Note that if this data is to be printed on a local printer, and a Hotel/Motel print-out is requested during an Autoprint print-out, then the Hotel/Motel print-out will not occur until after the completion of the Autoprint report.

Console Operation

6.08 Traffic Measurement data may be obtained by console commands. The appropriate commands are listed in Table 6-3. System Options 298 and/or 297 must have been enabled. Note that Polling

mode is not applicable for local printer operation, but Autoprint mode can be employed (see 6.07(b)).

Caution: It should be noted that reprogramming trunks and trunk groups in the middle of a Traffic Measurement run may cause invalid data results.

Additional Operating Notes

6.09 The following additional operating procedures should be noted:

(a) The Start and Run times must be selected by the console irrespective of the type (polling, autoprint or console) of output.

(b) If System Options 298 and 297 are not selected, the traffic utilities are illegal.

(c) If the supervisor resets the digital clock during a traffic run, a traffic report could be missed or printed twice. For example, assume that Autoprint is in effect and a Traffic Report is due at 10:00. If the clock is reset from 9:55 to 10:05, the report will be lost. If it is reset from 10:05 to 9:55, two reports will be printed of the 10:00 to 11:00 data. The supervisor should be cautioned against resetting the clock around the time of a Traffic Report.

(d) In addition, the system does not adjust for changes in time. In the above case, if the clock were changed from 9:40 to 9:55, only 45 minutes of data will appear at 10:00.

Automatic Call Distribution

6.10 All Supervisor Function Codes are listed in Table 6-4. The Supervisor can also obtain system-wide Agent Group data. This can be obtained from the Traffic Measurement report, which has an ACD supplement. Traffic Measurement can be printed at any time of the day by using a console Traffic Measurement function, at one specified time, or it can be automatically dumped every hour. At each print, the traffic data is based on the last hour's activity only. The ACD shift print-out has been organized to be printed with the traffic measurement data. After all traffic data has been printed, a list of all the activity on programmed Agent Groups will follow. The Agent Group data will have the form:

GROUP	CALLS ANSWERED	CALLS ABORTED	CALLS OVERFLOWED
1234	0274	0012	0010
5678	0302	0018	0013

Once this group data is printed, the calls answered and calls aborted counts are cleared. Unlike traffic measurements, the ACD data is always accumulated since the last print and not the last hour. Following the group data, a list of all the active Agents will be printed in the same format as the log-off print.

TABLE 6-1
TRAFFIC MEASUREMENT SYSTEM OPTIONS

System Option	Description
118	**Supervisor Printer Control Enable.** This option must be selected to enable the use of the printer control commands ⁎14 (Table 6-3).
295	**Traffic Measurement: Autoprint.** This option must be selected if the traffic data is to be output automatically at the end of each hour. See paragraph 6.02 and Note 1 below.
296	**Traffic Measurement: Compact Traffic Report.** If selected, this option causes the traffic data to be output in a compact format. Otherwise the standard format will be used. See paragraph 3.08.
297	**Console Function Enable (Traffic Measurement).** This option must be enabled if the functions ⁎130 to ⁎133 are to be legal (Table 6-3). If it is not enabled then ⁎13 causes an error to be displayed. See also Note 2.
298	**Traffic Measurement Enable.** This option must be enabled for the Traffic Measurement feature.
299	**Traffic Measurement: Extreme Value Mode.** This option must be selected if traffic collection is to operate in "Extreme Value Mode". If this Option is not selected then Standard Mode results. See paragraph 3.03.
300	**Traffic Measurement: Polling.** This option must be selected if the traffic data is to be polled by an external device. See paragraph 4.03.
311	**Ignore Print Enable.** This option must be enabled if the supervisor function code ⁎1400 or the maintenance function code 555 + 800 (see Table 6-3) is to be effective.
314	**Printer Transmit Additional Nulls:** This option must be selected if using the MITEL Printer at 1200 baud.

Notes:
1. Print-outs may be obtained by request of the console. See paragraphs 4.05 and Table 6-3.
2. By not enabling System Option 297 a Traffic Measurement run cannot be interrupted by Console Function ⁎130 to ⁎133. However the option must be reselected before traffic parameters can be changed or printing a report via the traffic utilities.

TABLE 6-2
SYSTEM OPTION CONFLICTS

System Option Selected	System Option Conflict
300 – Traffic Measurement Polling	248 – Automatic Wake-Up Print-out 247 – Room Register Audit Enable 295 – Traffic Measurement Autoprint 277 – SMDR Record Outgoing Calls 278 – SMDR Record Incoming Calls 279 – SMDR Record Only Incoming CO Calls 280 – SMDR Record Meter Pulses 281 – SMDR Drop Incomplete Outgoing Calls 282 – SMDR Drop Calls Of Less Than 8 Digits 283 – SMDR Extended Record 284 – SMDR Indicate Long Calls 312 – Message Register and Message Waiting Change Print Enable 316 – Room Message Register Audit Enable And All Maintenance Function Print-outs
295 – Traffic Measurement Autoprint	300 – Traffic Measurement Polling

TABLE 6-3
TRAFFIC MEASUREMENT FUNCTION CODES

Function Code	Description
	PART A - CONSOLE FUNCTION CODES
	Note: See description for System Option 297 in Table 6-1.
⁎130	**Select Start Time.** The start time for a Traffic Measurement run may be displayed and/or set by the console supervisor as follows: • Enter ⁎130 from keypad • SOURCE display shows: hhmmx (existing time) where: hh = hours mm = minutes x = P if p.m. x = (space) if a.m. or 24-hour clock • Enter new start time hhmmy (new time) where: y = ⁎ if p.m. y is not required if a.m. or 24-hour clock • Press RELEASE Key
⁎131	**Select Length of Run.** The run length (in multiples of 1 hour) may be displayed and/or set by the console supervisor as follows: • Enter ⁎131 from keyboard • SOURCE display shows: tt (number of hours) • Enter new run time tt (1 to 24) • Press RELEASE Key A run length of 24 means that Traffic Measurement will run continuously.
⁎132	**Print Traffic Data.** Traffic data may be output by the console supervisor as follows: • Enter ⁎132 from keypad • Press RELEASE Key The current count held in the storage registers are output to printer or tape but see paragraph 4.05.
⁎133	**Cancel Traffic Measurement.** The traffic measurement run, if in progress, may be canceled by the supervisor as follows: • Enter ⁎133 from keypad • Press RELEASE button This function results in resetting the start time to 00:00, the run length to 0, and zeroing the traffic registers. To restart traffic measurement, new start and run times must be entered.

TABLE 6-3 (CONT'D)
TRAFFIC MEASUREMENT FUNCTION CODES

Function Code	Description
⁎14⁎	**Suspend Print-out** (Note 1). Traffic data output may be suspended by the console supervisor, in order to change paper for example. The command is as follows: • Enter ⁎14⁎ from keypad • Press RELEASE Key Print-out is suspended at the end of a current line if one is being printed. No output is lost. Caution should be observed in using this function code because if it is set for an extended period it may terminate certain activities. System Option 118 must be enabled for this command to be effective.
⁎14#	**Resume Print-out.** Traffic data output may be resumed after either a "suspend" or "ignore" (see below) by the console supervisor as follows: • Enter ⁎14# from keypad • Press RELEASE Key System Option 118 must be enabled for this command to be effective.
⁎1400	**Purge and Ignore Printout.** Traffic data output may be ignored (inhibited) by the console operator if the requirement arises to use the printer for other purposes. The command is as follows: • Enter ⁎1400 from keypad • Press RELEASE button All print-out is ignored and lost. System Options 196 and 210 (see Table 6-1) must be enabled for this command to be effective.
	PART B - MAINTENANCE FUNCTION CODES Some of the console function codes (Note 2) may be duplicated from the System test line and perform the same function. These are listed below:
555 + 8 + ⁎	**Suspend Print-out.** The ⁎ may be replaced by 1 on a rotary dial.
555 + 8 + #	**Resume Print-out.** The ⁎ may be replaced by 2 on a rotary dial.
555 + 8 + 00	**Ignore Print-out.** System Option 311 (Table 6-1) must be enabled for this function to be effective.

Notes: 1. This table assumes the access code ⁎ has been assigned to feature number 18 (Supervisor Function).
2. This table assume the access code 555 has been assigned to feature number 19 (Maintenance Function).

TABLE 6-4
SUPERVISOR FUNCTION CODES

To specify the maximum MTTA for each Agent Group, and at the same time the overflow destination for all incoming calls when the MTTA exceeds this maximum:

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

To display the current maximum time to answer and overflow code:

- Dial *246
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button to terminate display.

To specify the after-call work time applicable to all Agents in each Agent Group:

- Dial *245
- Dial Agent Group Access Code
- Dial work time, in two digit seconds
- Dial * to enter another Agent Group number or
- Press the RELEASE button when finished.

To program a RAD:

- Dial *230
- Dial the RAD equipment number
- Dial * to proceed to the next equipment
- Press the RELEASE button.

To program a RAC:

- Dial *231
- Dial the RAC equipment number
- Dial * to proceed to the next equipment
- Press the RELEASE button.

To delete a RAD:

- Dial *230
- Dial the RAD equipment number
- Dial #
- Press the RELEASE button.

TABLE 6-4 (CONT'D)
SUPERVISOR FUNCTION CODES

To delete a RAC:

- Dial ⁎231
- Dial the RAC equipment number
- Dial #
- Press the RELEASE button.

To review all defined RADs/RACs:

- Dial ⁎232⁎ – the first RAD/RAC equipment number programmed will appear in the SOURCE display in the left corner and a 0 in the right corner to indicate a RAD or 1 in the right corner to indicate a RAC
- Dial ⁎ to advance to next RAD/RAC or press the RELEASE button to terminate.

To record a message on the RAC:

- Dial ⁎240
- Dial RAC equipment number
- Dial ⁎
- Supervisor waits until a 50-msec "beep" is heard
- Supervisor speaks message (up to 8-seconds in duration) into handset
- Press the RELEASE button when finished.

To playback a message from a RAC:

- Dial ⁎241
- Dial RAC equipment number
- Dial ⁎
- Message will be heard with handset, otherwise busy tone will be heard if the recording is currently in use
- Press the RELEASE button to terminate.

To specify the length of the message:

- Dial ⁎242
- Dial the Recording Group Access Code
- Dial the recording duration, in two digit seconds.

To specify the recordings and delay times for an Agent Group:

- Dial ⁎243
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial Access Code
- Dial time delay, in two digit seconds
- Dial ⁎ to enter another recording number or
- Press the RELEASE button.

TABLE 6-4 (CONT'D)
SUPERVISOR FUNCTION CODES

To review recording assignments:

- Dial *244
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial * to review another recording assignment or
- Press the RELEASE button.

To delete all data associated with an Agent Group (maximum MTTA, overflow specification, Recording Group and delay time assignments):

- Dial *243
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button.

To define which Recording Group a DID Intercept will be routed to:

- Dial *233
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete DID intercept routing:

- Dial *233
- Dial #
- Press the RELEASE button.

To define which Recording Group an Automatic Wake-Up will be routed to:

- Dial *234
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete which Recording Group an Automatic Wake-Up will be routed to:

- Dial *234
- Dial #
- Press the RELEASE button.

To examine the current status of an Agent Group:

- Dial *247
- Dial Agent Group Access Code
- Press the RELEASE button to terminate.

SX-100*/SX-200*
AUTOMATIC CALL DISTRIBUTION SYSTEM
STATION MESSAGE DETAIL RECORDING
GENERIC ACD

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1. GENERAL

Introduction

1.01 This Section gives a general description of the Station Message Detail Recording (SMDR) feature which is applicable to SX-100 and SX-200 Automatic Call Distribution (ACD) Systems when fitted with the ACD software package. It also describes the installation, programming and operational parameters for the SMDR feature.

Reason for Issue

1.02 This Section has been issued to provide Automatic Call Distribution information.

Related Documents

1.03 Table 1-1 lists the MITEL practices associated with the SX-100/SX-200 ACD Systems.

Brief Description

1.04 Station Message Detail Recording, also known as "Call Detail Recording", allows a business to analyze, and thus control, its telephone costs. Data is collected for each outgoing and/or incoming trunk call. Each such call generates a call record which is available at the RS232 port of the system. This output can be connected to:

- a local printer which gives an on-line printout at the termination of each trunk call; or
- a magnetic tape recorder or similar storage medium which collects data for each event, for subsequent processing by a service bureau to produce reports on telephone usage for management; or
- directly to a service bureau via a dedicated line for more timely processing.

1.05 Each time a trunk is seized by a call outgoing from the System a record is generated. This record is applicable regardless of the call duration, the identity of the originating party (i.e. an extension, the Supervisor or another incoming trunk) or whether the call is completed. Examples of such calls are contained in Part 5. If the trunk cannot be seized (e.g. the trunk is busy), a record is not made of the call. Certain types of calls may not be recorded (see System Options 279, 281 or 282, Table 4-1).

1.06 Incoming trunk call data may be recorded. The record is generated regardless of the call duration, or whether the call is completed (e.g. the called party is busy).

TABLE 1-1
SX-100/SX-200 DOCUMENTATION

R1

VOLUME 1	
Section No.	**Title**
MITL9105/9110-090-000-NA	Documentation Index
MITL9105/9110-090-100-NA	SX-100/SX-200 General Description
MITL9105/9110-090-105-NA	Features and Services Description
MITL9105/9110-090-150-NA	Physical Description and Ordering Information
MITL9105/9110-090-180-NA	Engineering Information
MITL9105/9110-090-212-NA	Multi-Digit Toll Control
MITL9105/9110-090-213-NA	Automatic Route Selection (ARS)
MITL9105/9110-090-220-NA	Speed Call
MITL9105/9110-090-222-NA	Automatic Call Distribution Description
MITL9105/9110-090-315-NA	Supervisor Console Description
MITL9105/9110-090-450-NA	Traffic Measurement
MITL9105/9110-090-451-NA	Station Message Detail Recordering
MITL9105/9110-090-500-NA	General Maintenance Information

VOLUME II	
Section No.	**Title**
MITL9105/9110-090-000-NA	Documentation Index
MITL9105/9110-090-200-NA	Shipping, Receiving and Installation
MITL9105/9110-090-205-NA	Installation Forms
MITL9105/9110-090-210-NA	System Programming
MITL9105/9110-090-215-NA	System Test Procedures
MITL9105/9110-090-320-NA	Extension Test Procedures

VOLUME IV	
Section No.	**Title**
MITL9105/9110-090-350-NA	Troubleshooting

1.07 Internal calls, i.e. calls between extensions or between the extension and the Supervisor, are not recorded.

1.08 Closely associated with Station Message Detail Recording is the ability to incorporate account codes on the SMDR record. Account codes may be used by the customer for the purpose of client billing or management reports. The account code feature with its variable options and associated operating procedures is described in Appendix 1.

DART

1.09 The DART is a microprocessor controlled call costing unit that utilizes the SMDR printouts to provide call costing information. See Section MITL9105/9110-090-105-NA for further details.

2. DETAILED DESCRIPTION

General

2.01 Each time a trunk is seized, information is collected for the trunk until the trunk is released. The descriptive record is formatted and is available as output. If two or more trunks are involved in a call, a separate record is generated for each trunk. This allows each trunk to be analyzed for costing purposes. If an extension dials a trunk, talks to it, then transfers it to another extension, only one call record is generated. However, the number of the second extension appears in the record.

Recorded Information

2.02 SMDR data which is recorded provides information on the following items:

(a) Outgoing, and incoming calls.

(b) Digits dialed on the trunk (maximum capacity 26 digits).

(c) Account Codes of up to 12 digits.

(d) Meter Pulses (option).

(e) Outgoing and incoming trunk numbers.

(f) System Identity (option).

(g) Long calls identified (with programmed durations).

(h) Time to answer for incoming calls.

(j) Identifies second extension in a transfer.

(k) Identifies conferences and transfers.

(m) Records answer supervisions.

(n) Indicates if the Supervisor was involved in the call.

2.03 The data is output at the RS232 port (Part 3), and each record occupies an 80- character row. If it is also required to print out the System Identifier, then System Option 283 (Table 4-1) must be enabled; and the row increases to 84 characters in length. If the Account code is of eight digits or less the line length will be 88 characters.

2.04 A description of each field which appears in an SMDR record is shown below, and the complete group of fields is summarized in Table 2-1. This Table includes information with regard to the field symbols used in the following descriptions.

- Long Call Indicator. This optional field contains a "-" for calls of duration 5 to 14 minutes 59 seconds, a "%" for calls of duration 15 to 29 minutes 59 seconds, and a "+" for calls of 30 or more minutes. This is useful when records are to be manually scanned.

- Date (mm/dd). The date is reported numerically as a 2-digit month followed by day. The year is not reported.

- Start Time (hh:mmp). The start time of a call is reported in hours and minutes. Either 12-hour or 24-hour format may be employed.

- Duration of Call (ddd ddd). The call duration is reported in hours, minutes and seconds. Leading zeroes are output (Maximum time = 18 hr, 12 min, 16 s).

- Calling Party (pppp). This is the party that originated the call. It may be an extension, the Supervisor, or an incoming trunk, as described below.

(a) Extension Number as Calling Party (cccc). An extension number may be from 1 to 4 digits (0-9, *, #). It is left-justified and space-filled.

(b) Supervisor as Originating Party (ATTm). Calls originated by the Supervisor that do not involve a third party, report a calling party of ATT followed by the console number (0-2). If the Supervisor calls an outside party on behalf of an extension or trunk, that extension or trunk is reported as the caller but the Supervisor Flag symbol * appears in the "Supervisor was Involved" field (5.03).

(c) Trunk Equipment Number as Calling Party (Tnnn or Xnnn). If the originating party is an incoming trunk, it is output as "Tnnn" for CO trunks and "Xnnn" for non-CO trunks. The "nnn" is the equipment number of the trunk. It has a range from 002 to 112, or 162 to 256. It is always even and includes leading zeroes. The "T" or "X" ensures that this number and CO Supervisor trunks may be distinguished from tie trunks.

- Supervisor made or answered the Call (f). This 1-digit field identifies calls originated by or initially answered by the Supervisor, and reported as a "*". This flag will not appear under other circumstances (i.e. if a call is transferred to the Supervisor).

- Trunk Group Access Code (gggg). This field applies to outgoing calls. For incoming calls this field is used to report Time to Answer (see below). The trunk group access code may be from 1 to 4 digits long (0-9, *, #). It is left-justified and space-filled.

TABLE 2-1
SUMMARY OF FIELDS IN SMDR RECORDS

R1

Name	Columns	Format	Definition	Notes
Long Call	1	z	- = 5-14 min % = 15-29 min + = 30 or more min	See System Options Table
Date	2-6	mm/dd	mm = Month dd = Day	mm = 01-12 dd = 01-31
Spacer	7		-- = Space	
Start Time	8-13	hh:mmp	hh = Hours mm = Minutes p = pm	1-12 or 0-23 00-59 p = PM (12-hour clock) -- = AM (24-hour clock)
Spacer	14		-- = Space	
Duration of call	15-22	hh:mm:ss	hh:mm:ss = duration in hours:minutes:seconds	hh = 00-18, mm = 00-59 and ss = 00-59
Spacer	23		-- = Space	
Calling Party	24-27	pppp	cccc = Extension Number Tnnn = Trunk Equipment Number (CO) Xnnn = Trunk Equipment Number (Non CO) ATTm = Supervisor	c = 0-9, *, # nnn = 002-112, 162-256 m = Console No. (0-2)
Spacer	28		-- = Space	
Supervisor	29	f	* = Supervisor -- = Supervisor not involved	Supervisor answered or initiated the call, then transferred it to an extension
Trunk Group Access	30-33	gggg	cccc = Access Code Outgoing and Tandem Calls Only	c = 0-9, *, #, left-justified
Time to Answer (Alternate)	30-33	Ottt	Ottt = Time in seconds (000-256) *** = Call unanswered	Leading zeroes output. Incoming calls only.
Digits Dialed on the trunk	34-59	xx x	Up to 26 (20 if metering) digits dialed on the trunk	x = 0-9, *, or # No digits if number is confidential speed call

TABLE 2-1 (CONT'D)
SUMMARY OF FIELDS IN SMDR RECORDS

Name	Columns	Format	Definition	Notes
Meter (Optional)	55-59	mmmm	mmmm = Number of meter pulses	mmmm = 00000 to 65536 Leading zeroes outputted
Call Completion Status	60	h	A = Answer Supervision B = Callee is Busy E = Caller Error T = Toll Denied or TAFAS answered	Outgoing Incoming Direct/Dial-In Incoming/Dial-In Incoming Incoming/Outgoing
ARS or Speed Call Flags	61	S or - F, R, C.	S = Number was Speed called F = Forwarded Externally R = Routed via ARS C = Speed Call and ARS	Outgoing
Called Party	62-65	qqqq	cccc = Extension Number Tnnn = Trunk Equipment No. (CO) Xnnn = Trunk Equipment No. (Non-CO) ATTm = Supervisor	C = 0-9, *, # nnn = 002-112, 162-256 (SX-200) m = Console No. m = 0-2
Transfer/ Conference Call	66	K	T = Supervised Transfer X = Unsupervised Transfer C = Three-Way or Conference	"Dead Transfer" or "Transfer into Busy"
Spacer	67		-- = Space	
Third Party	68-71	rrrr	cccc = Extension Number	c = 0-9, *, #
Spacer	72		-- as a space	
Account Code (Optional)	73-84	aa .... a	Length of 1 to 12 digits	a = 0-9 space-filled
Spacer (Optional)	85		-- = Space	
System Identifier (Optional)	86-88	iii	Entered by System ID Console Function (*17)	iii = 000-999 000 = "No Code entered"

- Time to Answer (ttt). This is the number of seconds from the time the trunk is seized incoming, until the call is answered. If the call is never answered, this field displays ***. It applies to incoming calls only; the same field is used to define the trunk group access code for outgoing calls (see above). Leading zeroes are output. It reverts to zero after reaching 256.

- Digits Dialed on the Trunk (xxx---x). The maximum number of digits (0-9, *, #) recorded is 26. If the "SMDR Record Meter Pulses" option is selected, this reduces to 20, to leave room for the 5-digit meter. On outgoing calls, this field does not include the trunk group access code unless it is an "Identified Trunk Group", in which case this is pulsed out on the trunk in front of the digits dialed. On dial-in trunk calls, the digits dialed in on the trunk are recorded. If more than 26 digits are dialed, the 26th is overwritten. No digits are recorded if the number is confidential.

- Meter Pulses (mmmmm). The number of reversals received from an outgoing trunk is optionally recorded. The range is 0 to 65536. Leading zeroes are output. The "SMDR: Record Meter Pulses" option must be selected. The maximum number of digits recorded reduces from 26 to 20. The trunk group must be programmed for "Answer Supervision"; that is, the first digit of the trunk group "Type" must be "2" or "4". Meter pulses are not recorded for other groups.

- Call Completion Status (h) (Outgoing Calls). This field is used to report the completion of an outgoing call in so far as the System is able to determine it. If the outgoing call fails the toll deny checking, and is dropped, this field contains a "T". If the trunk group is programmed to take "Answer Supervision" (i.e. first digit of its "Type" is "2" or "4"), and a supervision is received, an "A" is reported. If the trunk group is programmed for "Toll Reversal" (i.e. first digit of its "Type" is "3"), and a supervision is received, a "T" is reported.

- Call Completion Status (Incoming Calls). On incoming calls, the System knows the outcome of the call and thus can report it more fully. If the extension or hunt group to which the call is directed is busy, a "B" is recorded. If an incoming dial-in trunk dials an invalid number and receives reorder tone, an "E" is reported. The field is blank for incomplete calls. A "T" is reported if the incoming trunk is answered with TAFAS.

- Speed Call or ARS Flags. This field contains an "S" if the number was speed dialed, an F for forwarded externally, an R for routed via ARS and a C for combined Speed Call and ARS.

- Called Party (qqqq). This is the party to whom the call is directed. It may be an extension number, the Supervisor or, for outgoing calls, the equipment number of the trunk. The format in which the called party is output is identical to that used for

the calling party. See Calling Party (pppp). On incoming calls directed to the Supervisor, the called party would be the Supervisor unless the Supervisor transfers it to an extension, in which case, it is the extension number. For direct-in lines, it would be the extension number. For more information, see 5.05.

- Transfer/Conference Call (K). Calls that involve three or more parties are indicated by means of this field. It contains a "T" for supervised transfers, "X" for unsupervised transfers (i.e. dead transfer or transfer into busy) and a "C" for three-way conversations and conferences.

- Third Party (rrrr). The third party field contains the number of the extension to which a trunk call has been transferred by another extension. If several transfers take place for one trunk call, the first party is the only one reported. The format is identical to that of the Calling Party (pppp).

- Account Code (aaa ... a). This is an optional field and is only present if the "Account Code" feature is used. See Appendix 1 for a discussion of account codes. Account codes may only contain digits from 0 to 9, and their maximum length is 12 digits. Leading zeroes are reported if they are dialed.

- System Identifier (iii). This optional 3-digit field may contain values from "000" to "999". "000" means no identifier has been entered.

3. INSTALLATION

General

3.01 Installation, to meet the Station Message Detail Recording requirements, consists of the following steps:

(a) Verification that Generic ACD software is included in the SX-100 or SX-200 ACD system.

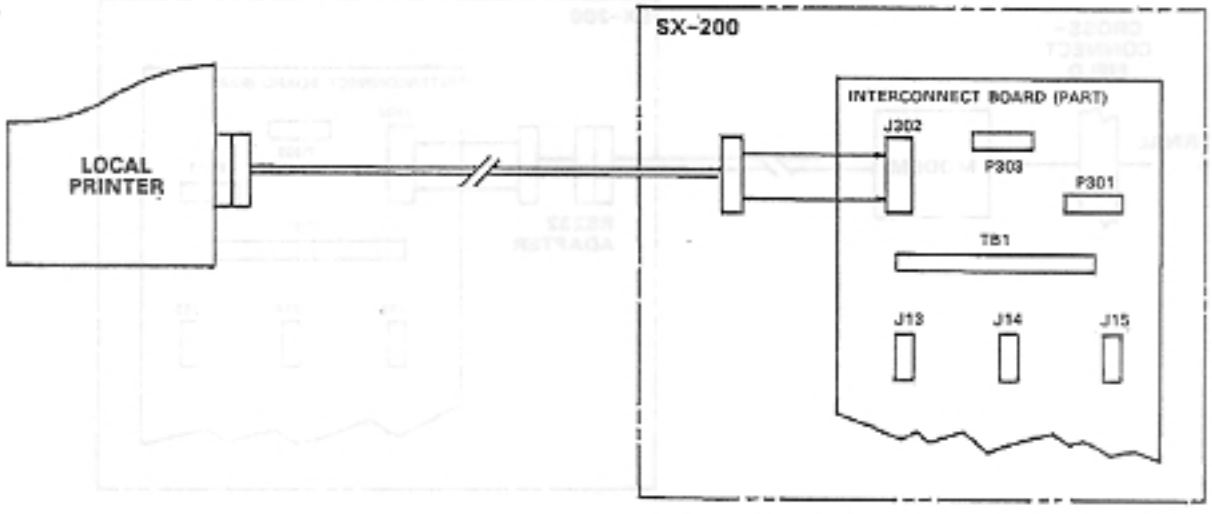
(b) Determination of the required output configuration (Figs. 3-1 and 3-2).

(c) Installing the hardware items.

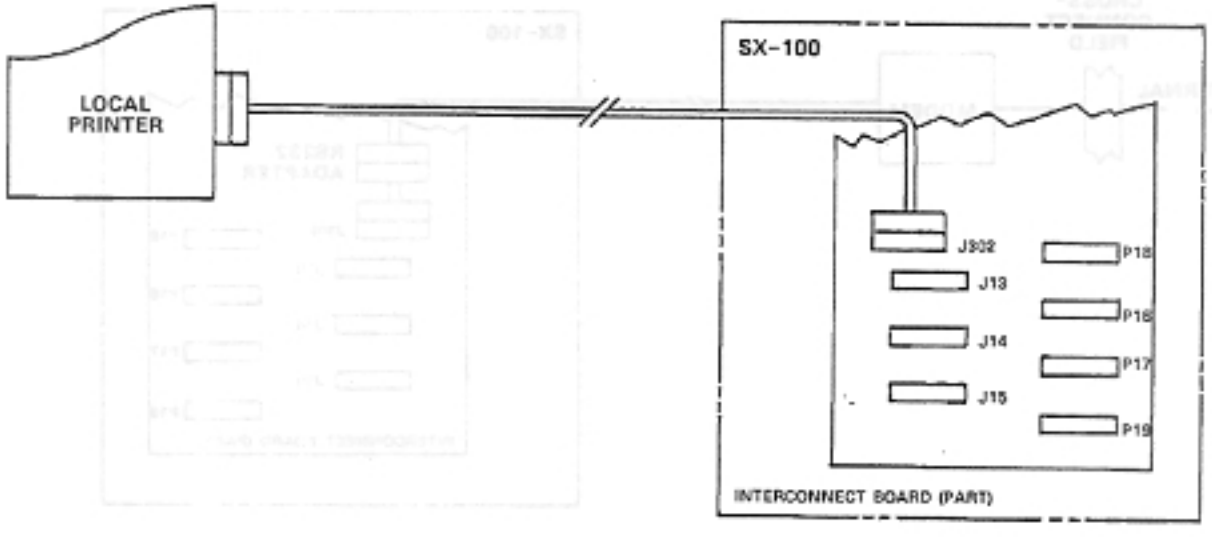
(d) Programming and operation of the completed system (Parts 4 and 5).

Printer Configuration

3.02 The SX-100 and SX-200 ACD System has an RS232 data port to the SMDR facility. A local printer may be connected to this port to provide on-premises printout (Figure 3-1). The port may also be connected to a remotely located facility via an RS232 adapter and a modem (Figure 3-2). The required printer characteristics are as follows:



(A) CABLING FOR SX-200 DATA PORT



(B) CABLING FOR SX-100 DATA PORT

X1294R1

Figure 3-1 Cabling to Local Printer

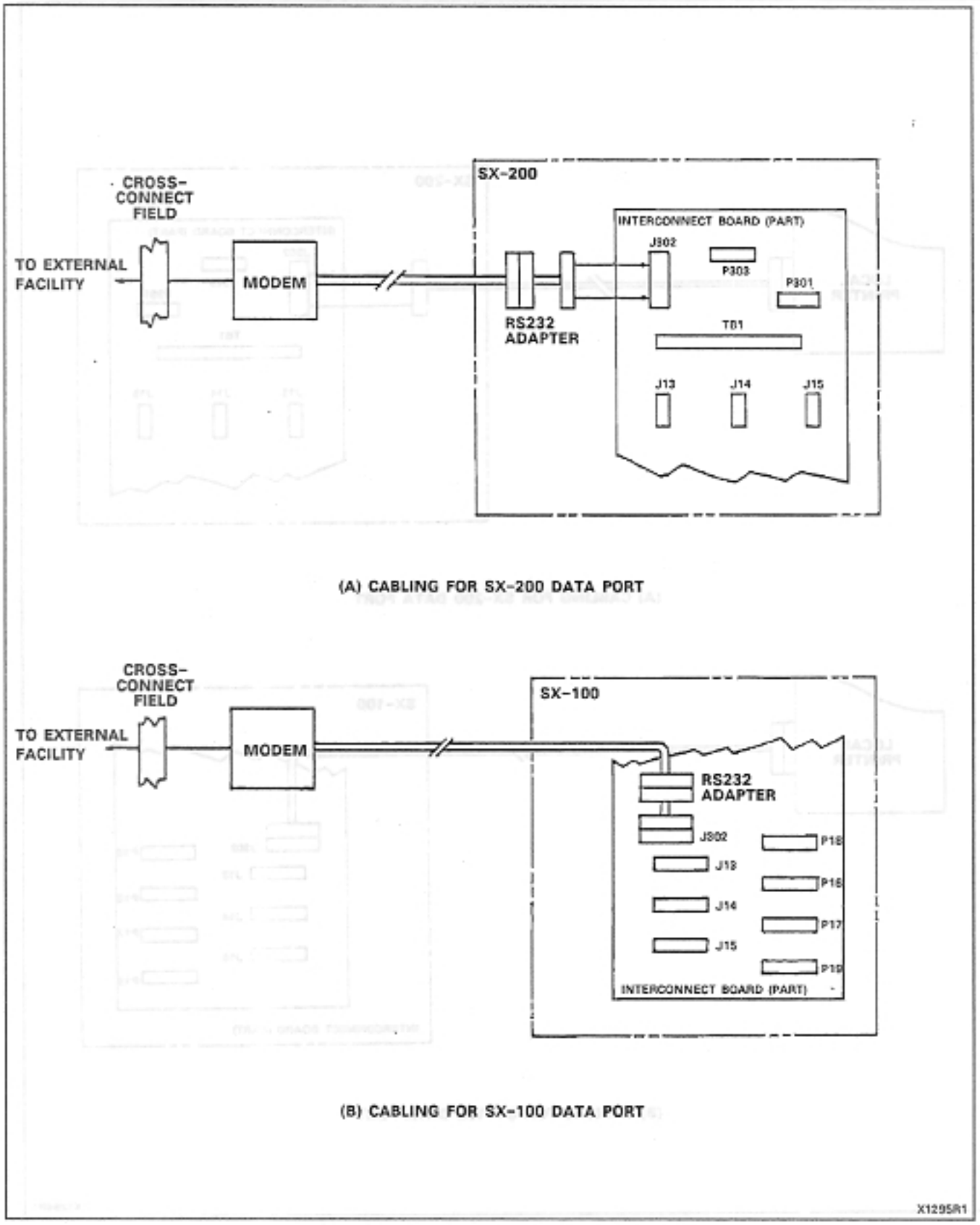


Figure 3-2 Cabling to Remote Printer

(a) 80-character line length. If the system identifier is to be printed (System Option 283 enabled), an 88-character line length is required.

(b) 300- or 1200-baud character rate. Baud rate is switch-selectable on the scanner card to accommodate the rate.

(c) The subset of required ASCII characters is illustrated in Table 3-1.

(d) Each line printout from the System data port is terminated by a "carriage return" and "line feed" character. For printers which required an extra delay, six "NULL"' characters may be added to the termination (System Option 313). For a further additional delay, select System Option 314 (Printer Transmit Additional Nulls).

Magnetic Tape Recorder Configuration

3.03 The data port may also be (locally or remotely) terminated by an RS232 compatible magnetic tape recorder or similar storage medium instead of a printer. The SMDR data thus stored may be subsequently retrieved as required.

Cabling and Cross-Connections

3.04 Section MITL9105/9110-090-200-NA details the installation of SX-100 and SX-200 systems. Parts 9 (Installation Requirements) and 10 (Cabling and Cross-Connections) of the Section show the general procedures to be used in making these connections.

Cabling Requirements, Local Terminal

3.05 The printer or recorder should be located as near as possible to, and no further than 50 ft (15.2 m) from the System. A 25-conductor connectorized cable must be run and connected between the local printer and the data port (plug J302). Table 10-2 of Section MITL9105/9110-090-200-NA shows the connections of plug J302.

Cabling Requirements, Remote Facility

3.06 When the data port interconnects with a remotely located facility, requiring the use of a modem, an RS232 Adapter (MITEL P/N 9110-052-000) is installed between the data port and the connectorized cable to the modem. The RS232 Adapter presents the proper interface connections required when the data port (J302) is cabled to the modem. The modem is connected via the cross-connect field to the external facility following standard installation practices. Figure 3-2 illustrates these cabling arrangements. Note: Unless a modem is used, the maximum cable length is 50 ft (15.2 m).

TABLE 3-1
CHARACTER SET

R1

BIT NUMBERS												
								0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1
b_7	b_6	b_5	b_4	b_3	b_2	b_1	COLUMN / ROW	0	1	2	3	4	5
			0	0	0	0	0	NUL		SP	0		P
			0	0	0	1	1		DC1	!	1	A	Q
			0	0	1	0	2			"	2	B	R
			0	0	1	1	3		DC3	#	3	C	S
			0	1	0	0	4				4	D	T
			0	1	0	1	5			%	5	E	U
			0	1	1	0	6			&	6	F	V
			0	1	1	1	7	BELL		/	7	G	W
			1	0	0	0	8			(	8	H	X
			1	0	0	1	9			)	9	I	Y
			1	0	1	0	A	LF		*	:	J	Z
			1	0	1	1	B			+	;	K	
			1	1	0	0	C	FF		,		L	
			1	1	0	1	D	CR		–	=	M	
			1	1	1	0	E			.		N	
			1	1	1	1	F			/	?	O	

NOTES: 1. Control DC1 or a "break" or NULL causes printing.
2. Control DC3 suspends printer.

4. PROGRAMMING

General

4.01 This Part describes the programming options and procedures which are required in connection with Station Message Detail Recording and also refers to other options which are of particular interest to SMDR.

4.02 System and COS Options which are directly applicable to SMDR, and other options which are required for printer operation, are described in Table 4-1.

4.03 Console Access Function codes which are required to perform printer control functions from either an Supervisor or a maintenance console are listed in Table 4-2. Supervisor function codes are discussed in Table 4-3.

4.04 Account Code programming options and features are described in Appendix 1.

Programming Procedures

4.05 Programming procedures for SX-100 and SX-200 Systems are detailed in Section MITL9105/9110-090-210-NA. When the SMDR facility is a requirement, the SMDR options and features should be programmed with the other options and features for new installations; or they may be added for existing installations.

4.06 The SMDR facility is not effective unless the proper Trunk Group type is programmed. Thus SMDR reporting can be restricted to only certain Trunk Groups. When so programmed only this type will force an account code (Appendix 1) to be entered before dialing the trunk group. When entering the Trunk Group program, as detailed in Section MITL9105/9110-090-210-NA, the 4-digit type must have, as the second digit entered, the digit "3" or "4". When the digit "4" is entered, the Mesage Registration feature also applies to this Trunk Group.

4.07 On completion of programming, the SMDR facility will be operational. A brief outline of the operational procedures with examples of SMDR printouts is contained in Part 5.

5. OPERATIONAL PARAMETERS

General

5.01 There are no special operational procedures employed by the Supervisor or extension, except when account codes are required to be reported and Supervisor function codes. In this case the procedures outlined in Appendix 1 are followed. The following operational parameters should be noted when SMDR is used.

Non-Recording Conditions

5.02 SMDR is initiated when an outgoing trunk is seized, and (if enabled) when an incoming trunk is seized. SMDR is not initiated under the following conditions:

- Busy tone is obtained by the Supervisor or an extension when a trunk is dialed (because all trunks in the group are busy).
- Reorder tone is obtained by the caller.
- The Supervisor intercepts an extension attempting to access a trunk group.
- During a power failure condition no SMDR records are made because storage is in the volatile RAM.

5.03 SMDR is also not initiated if the Trunk Group is not programmed for SMDR (4.06); or the following System Option is enabled and the relevant conditions (Table 4-1) apply:

- System Option 281 – SMDR Drop Incomplete Outgoing Calls

Supervisor-Handled Calls

5.04 The following conditions are reported as shown when the Supervisor handles a call (see also 2.04):

- If the Supervisor dials a trunk with no extension or trunk involved, the calling party is the Supervisor.
- Direct Trunk Accesses by the Supervisor are reported. The Trunk Group Access Code field is blank.
- If the Supervisor makes an unsupervised transfer to an extension, the called party is the Supervisor, and the extension appears as a third party.
- If the Supervisor answers a trunk call and does not transfer it to an extension, the called party is the Supervisor.
- If the Supervisor dials a trunk while it has an extension as its source, the calling party reported is the extension and "*" appears in the "Supervisor was Involved" field.
- If the Supervisor dials a trunk, then takes an extension off hold and hits RELEASE, the calling party is the extension and "*" appears in the "Supervisor was Involved" field.
- If the Supervisor has a trunk as Source, then dials an extension, the extension answers, the Supervisor presses RELEASE, the calling party is the trunk, the called party is the extension, and "*" appears in the "Supervisor was Involved" field.

Incoming Calls

5.05 When SMDR is enabled for incoming calls (System Option 278), the following conditions are reported:

- Digits dialed on incoming DID, DISA or dial-in tie trunks are reported in the "Digits Dialed on the Trunk" field. If the dial-in trunk dials an illegal or vacant number or hangs up before completing the number, the call is still reported. The called party is the extension dialed. The DISA Security Code is not reported.

- The called party is the Supervisor unless the Supervisor then dials an extension. In that case, the called party becomes the extension and an "*" is reported in "Supervisor was Involved". Supervisor-handled calls are further discussed in 5.04.

- Direct-in trunks will show the extension number as the called party (for example, dial-in trunks). However, the "Digits Dialed" field is blank. If the trunk is directed to a hunt group, the extension that answered the call is reported.

- On incoming calls, an "E" is reported if the trunk hangs up while listening to reorder tone, or a "B" if the trunk hangs up while listening to busy tone. A "T" is reported if the incoming call is answered with TAFAS.

Examples

5.06 Typical SMDR printouts are shown in Table 5-1.

Agent Performance Data

5.07 When an Agent logs off of an Agent position, a summary of the Agents shift will be printed. The shift record will be of the form:

DATE	GROUP	Agent	EXTN	LOGIN	SHIFT	CALLS	MINS
03/83	114	63	1234	09:00P	07:58	0123	0234

where the LOGIN time and SHIFT length are in hours:minutes, CALLS is the total number of calls handled, and the MINS is the total time on calls in minutes. The system Agent capacity (normally 30) will be decreased by 1 for every Agent that has logged off, but whose shift record has not yet printed. (It is similar to SMDR and trunks - if all SMDR buffers are in use, a trunk will not be released until the printer has printed its buffer)

TABLE 4-1
SMDR OPTIONS
SYSTEM OPTIONS

R1

System Options	Description
118	Supervisor Printer Control Enable. This Option must be selected to enable the use of the printer commands * 14 (Table 4-2).
314	Printer Transmit Additional Nulls. This Option should be enabled when using the MITEL Printer at 1200 baud.
277	Station Message Detail Recording: Outgoing Calls. This Option enables the Station Message Detail Recording feature for incoming trunk calls.
278	Station Message Detail Recording: Incoming Calls. This Option enables the Station Message Detail Recording feature for incoming trunk calls.
279	SMDR: Record Only Incoming CO Calls. If this Option is selected, incoming calls on incoming DID/CCSA and non-dial tie trunks are not recorded. The recording of incoming calls on dial-in tie trunks and DISA trunks is controlled via COS Option "No SMDR Record For This Line".
280	SMDR: Record Meter Pulses. If this option is selected, the number of meter pulses generated by the Central Office is reported in the SMDR record. With this Option, the number of digits recorded on the trunk is 20. If it is not selected, the number of digits is 26. This Option is not meaningful unless System Option 277 is also selected.
281	SMDR: Drop Incomplete Outgoing Calls. If this Option is selected, outgoing calls that are incomplete are not reported. If a Trunk Group is programmed for Answer Supervision, calls that do not receive Supervision are not reported. If a group is not programmed for Supervision, a "pseudo-answer supervision" time-out must be assumed. Calls that last less than that time are not reported. The same timer is used as for Message Registration, i.e. it is 20, 30 or 40 seconds depending on the status of Options 194 and 195.
282	SMDR: Drop Calls of Less Than 8 Digits. If this Option is selected, outgoing calls in which less than 8 digits are dialed on the trunk are not reported. This Option is only meaningful if Option 277 is also enabled.
283	SMDR: Extended Record. If this Option is enabled, the length of the SMDR record is extended from 80 to 88 columns. This allows the last four columns of 12-digit account codes and the System ID to be reported.
284	SMDR: Indicate Long Calls. If this Option is selected, calls of 5 minutes or longer are flagged in the SMDR record (see also Table 2-1).
311	Ignore Print Enable. This Option must be enabled if the Supervisor Function * 1400 (Table 4-2) is to be effective.
313	Printer Carriage Return Delay. The Option causes six nulls to be sent to the printer following Carriage Return/Line Feed. This delay is not required by some printers. If this Option is not selected, no nulls are sent.

TABLE 4-2
SMDR CONSOLE FUNCTIONS CODES

R1

System Options	Description
	Part A – Supervisor Function Codes †
14	Suspend Printout. SMDR output may be suspended by the console Supervisor, for example in order to change paper. The command is as follows: Enter *14* from keypad Press RELEASE button Printout is suspended at the end of a current line if one is being printed. No output is lost. Caution should be observed in using this function code because if it is set for an extended period it may result in the build-up of busy conditions on outgoing trunk groups and the prevention of incoming trunk calls.
*14#	Resume Printout. Traffic data output may be resumed after either a "suspend" or "ignore" (see below) by the console Supervisor as follows: Enter *14# from keypad Press RELEASE button
*1400	Purge and Ignore Printout. SMDR output may be ignored (inhibited) by the console operator if the required arises to use the printer for other purposes. The command is as follows: Enter *1400 from keypad Press RELEASE button All printout is ignored and lost. System Option 311 (see Table 4-1) must be enabled for this command to be effective.
	Part B – Maintenance Function Codes **(It is assumed that 555 is the maintenance function code in the list.)** Some of the console function codes must be duplicated from the System test line and perform the same function. These are listed below:
555 + 8 + * or 1	Suspends printout. The last symbol may be replaced by 1 on the rotary dial.
555 + 8 + # or 2	Resumes printout. The last symbol may be replaced by 2 on the rotary dial.
555 + 8 + 00	Ignore printout. System Option 311 (see Table 4-1) must be enabled for this function to be effective.

† This document assumes that the * symbol has been assigned as an access code to feature number 18 (Supervisor Function).

TABLE 4-3
SUPERVISOR FUNCTION CODES

To specify the maximum MTTA for each Agent Group, and at the same time the overflow destination for all incoming calls when the MTTA exceeds this maximum:

- Dial ⁎246
- Dial Agent Group Access Code
- Dial maximum time to answer, in seconds
- Dial overflow Access code (Agent/Recording Group, Supervisor)
- Dial ⁎ to enter another Agent Group number or press the RELEASE button.

To display the current maximum time to answer and overflow code:

- Dial ⁎246
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button to terminate display.

To specify the after-call work time applicable to all Agents in each Agent Group:

- Dial ⁎245
- Dial Agent Group Access Code
- Dial work time, in two digit seconds
- Dial ⁎ to enter another Agent Group number or
- Press the RELEASE button when finished.

To program a RAD:

- Dial ⁎230
- Dial the RAD equipment number
- Dial ⁎ to proceed to the next equipment
- Press the RELEASE button.

To program a RAC:

- Dial ⁎231
- Dial the RAC equipment number
- Dial ⁎ to proceed to the next equipment
- Press the RELEASE button.

To delete a RAD:

- Dial ⁎230
- Dial the RAD equipment number
- Dial #
- Press the RELEASE button.

TABLE 4-3 (CONT'D)
SUPERVISOR FUNCTION CODES

To delete a RAC:

- Dial ⁎231
- Dial the RAC equipment number
- Dial #
- Press the RELEASE button.

To review all defined RADs/RACs:

- Dial ⁎232⁎ – the first RAD/RAC equipment number programmed will appear in the SOURCE display in the left corner and a 0 in the right corner to indicate a RAD or 1 in the right corner to indicate a RAC
- Dial ⁎ to advance to next RAD/RAC or press the RELEASE button to terminate.

To record a message on the RAC:

- Dial ⁎240
- Dial RAC equipment number
- Dial ⁎
- Supervisor waits until a 50-msec "beep" is heard
- Supervisor speaks message (up to 8-seconds in duration) into handset
- Press the RELEASE button when finished.

To playback a message from a RAC:

- Dial ⁎241
- Dial RAC equipment number
- Dial ⁎
- Message will be heard with handset, otherwise busy tone will be heard if the recording is currently in use
- Press the RELEASE button to terminate.

To specify the length of the message:

- Dial ⁎242
- Dial the Recording Group Access Code
- Dial the recording duration, in two digit seconds.

To specify the recordings and delay times for an Agent Group:

- Dial ⁎243
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial Access Code
- Dial time delay, in two digit seconds
- Dial ⁎ to enter another recording number or
- Press the RELEASE button.

TABLE 4-3 (CONT'D)
SUPERVISOR FUNCTION CODES

To review recording assignments:

- Dial ⁎244
- Dial Agent Group Access Code
- Dial recording number (1-4)
- Dial ⁎ to review another recording assignment or
- Press the RELEASE button.

To delete all data associated with an Agent Group (maximum MTTA, overflow specification, Recording Group and delay time assignments):

- Dial ⁎243
- Dial Agent Group Access Code
- Dial #
- Press the RELEASE button.

To define which Recording Group a DID Intercept will be routed to:

- Dial ⁎233
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete DID intercept routing:

- Dial ⁎233
- Dial #
- Press the RELEASE button.

To define which Recording Group an Automatic Wake-Up will be routed to:

- Dial ⁎234
- Dial Recording Group Access Code
- Press the RELEASE button.

To delete which Recording Group an Automatic Wake-Up will be routed to:

- Dial ⁎234
- Dial #
- Press the RELEASE button.

To examine the current status of an Agent Group:

- Dial ⁎247
- Dial Agent Group Access Code
- Press the RELEASE button to terminate.

TABLE 5-1
SMDR PRINTOUTS

r2

```
0         1         2         3         4         5         6         7         8         9
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901
```

EXAMPLE 1 TWO PARTY OUTGOING CALL

```
-06/13  11:42 00:08:29  214   9   16135922122                A-T054    419356    000
```

On June 13th at 11:42 AM, extension 214 dialed an account code of "419356", then dialed "9" to get an outside line. The extension obtained trunk equipment number 54 and dialed "1-613-592-2122". Answer supervision was provided. The conversation lasted 8 minutes, 29 seconds.

EXAMPLE 2 TWO PARTY OUTGOING CALL

```
05/17  10:51 00:01:52  213   5   201                        A-X082                000
```

On May 17 at 10:51 AM, extension 213 dialed 5 to get an identified trunk group, then 201 to obtain an extension in the another System. The other System provided supervision and the conversation lasted 1 minute, 52 seconds. The trunk equipment number was 082.

EXAMPLE 3 TWO PARTY INCOMING CALL

```
01/30  03:10F00:02:22  T102  008 201                        201                   000
```

On January 30 at 3:10 PM, incoming direct-in trunk number 102 range in to extension 201. The extension answered after 8 seconds and they talked for 2 minutes, 22 seconds.

EXAMPLE 4 TWO PARTY INCOMING CALL

```
03/12  09:11 00:01:12  X116  007 63                        224                   000
```

On March 12 at 9:11 AM, dial-in tie trunk 116 dialed hunt group with access code "63". Extension 224 answered after 7 seconds, and the conversation lasted 1 minute, 12 seconds.

EXAMPLE 5 Supervisor HANDLED CALL - OUTGOING TRUNK

```
+01/30  03:27F00:35:11  201   *9  16545996951             A-T052                000
```

On January 30 extension 201 dialed the Supervisor and asked for an outside line. The Supervisor dialed 9 followed by 1-654-599-6951 then pressed RELEASE. At 3:27 PM the other party answered and the conversation lasted 35 minutes, 11 seconds. Trunk equipment 52 was used and answer supervision was received.

TABLE 5-1
SMDR PRINTOUTS (CONT'D)

```
0         1         2         3         4         5         6         7         8         9
12345678901234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901
```

EXAMPLE 6 SUPERVISOR HANDLED CALL – INCOMING TRUNK

```
04/05  01:42R00:00:31  T090  009                    ATT2                    000
```

On April 5th at 1:42 PM, trunk 90 rang into the Supervisor. After 9 seconds the Supervisor at console 2 answered. The trunk party spoke to the Supervisor for 31 seconds then hung up.

EXAMPLE 7 CALLING EXTENSION TRANSFER CALL

```
04/02  09:36 00:04:55  103   91   5922122                T162T100                000
```

On April 2nd at 9:36 AM, extension 103 dialed trunk access code 91 followed by 592-2122. The called party answered, and after conversing the caller transferred the called party to extension 100. After further conversation extension 100 hung up. The total period for both conversations was 4 minutes, 55 seconds. Trunk equipment 162 was used for the call.

EXAMPLE 8 CALLED EXTENSION TRANSFER CALL

```
03/12  07:42 00:03:06  T162  *003                    241T 215                000
```

On March 12th at 7:42 AM, trunk 162 rang the console and requested to speak to extension 241. The Supervisor took 3 seconds to answer the call. After speaking to extension 241 the latter extension then transferred the call to extension 215. The total conversation lasted 3 minutes, 6 seconds.

EXAMPLE 9 SUPERVISOR CONTROLLED CONFERENCE (WITH TRUNK)

```
%03/10 09:48 00:13:40  ATT1  ^93  5924130              T178C                   000
```

At 9:48 AM on March 10th the Supervisor dialed CO trunk access code 93 and seized trunk equipment 178. The call was then completed by dialing 592-4130. After speaking to the called party the Supervisor set up a controlled conference by dialing three internal extensions and adding them to the conference in turn. The conference lasted for 13 minutes, 40 seconds. The record will not show what extensions were added.

APPENDIX 1
ACCOUNT CODES

GENERAL

A1.01 Account codes may be used by the customer for the purpose of client billing or management reports. In addition, if an extension is programmed with COS options 56 and 83, it is unable to access a trunk circuit unless the proper account code is entered. Account codes may be from 1 to 12 digits in length.

PROGRAMMING

A1.02 A list of the System Options available is shown in Table A1-1. This illustrates the variations possible with regard to the length of the account code.

A1.03 Related additional programming requirements for use with account code operation are as follows:

- Class of Service Option 56 – Account Code Entry. An extension with this option may dial an account code before making a trunk call.
- Class of Service Option 83 – Forced Account Code Entry. An extension with this option in its COS must dial an account code before making an outgoing trunk call. It is effective only if COS Option 56 is enabled.
- Class of Service Option 110 – Special DISA. When this COS option is enabled in an incoming DISA trunks COS, a verifiable account must be dialed before the user can access an external trunk.
- Feature 31 – Account Access Code. An extension may dial this code followed by an account code prior to making a trunk call.
- Supervisor Function. The Supervisor Account Access Code function is accessed by dialing 0.
- See also Verifiable Account Codes, Section MITL9105/9110-090-105-NA.

OPERATION

A1.04 An Account Code may contain only the digits 0 through 9. * and # are illegal digits. If variable codes (Option 235) are used, the number of dialed digits (including the delimiter #) must be between 1 and the maximum length.

Extension Operation

A1.05 An extension, allotted an account code, proceeds to make a trunk call according to the abbreviated sequence shown below:

- The Account Access Code is dialed.
- The Account Number is dialed. This may require the addition of the delimiter symbol # (see System Option 134).
- The Trunk Group access code is dialed. If busy tone is heard, the call should be placed later, as it is not possible to set up a camp-on or callback when Account Codes are applicable.
- When dial tone is heard, the normal calling digits are dialed to obtain the required party.

Supervisor Operation

A1.06 The Supervisor may include an account code for a trunk call. The abbreviated sequence of operations is as follows:

- The Account Access Code (*0) is dialed.
- The Account Number is dialed followed by #.
- The Trunk Group access and required party number digits are dialed.

TABLE A1-1
ACCOUNT CODE SYSTEM OPTIONS

R1

System Options	Description
230	Account Code Enable. This Option enables the the Account Code feature. It has no effect unless one of the Station Message Detail Recording Options (277 and/or 278) is also enabled.
231	Verifiable Account Code Enable. If this option is enabled all account codes dialed would be verified with account codes that the Supervisor had entered.
232	Account Code Length = 4 Digits. If this Option is selected, the length or maximum length of an Account Code is 4 digits. This Option is only meaningful if Option 230 is also selected.
233	Account Code Length = 8 Digits. If this Option is selected, the length or maximum length of an Account Code is 8 digits. This Option is only meaningful if System Option 230 is also selected.
234	Account Code Length = 12 Digits. If this Option is selected, the length or maximum length of an Account Code is 12 digits. This Option is only meaningful if System Option 230 is also selected.
235	Variable Length Account Codes. If this option is selected, DTMF extensions and the Supervisor may enter an Account Code of less digits than the length defined by System Options 232/233/234. This is done by dialing a '#' as a delimiter. If this Option is not selected, only Account Codes of a fixed length, may be entered. This Option is not meaningful unless System Option 230 is also enabled.
NOTES:	1. If neither 232, 233 or 234 is selected, the length of Account Codes is 6 digits. 2. Only one of the Options 232, 233 or 234 should be selected. If more than one is set, the lowest is chosen.

TABLE A1-1
ACCOUNT CODE SYSTEM OPTIONS

System Options	Description
230	Account Code Enable. This Option enables the the Account Code feature. It has no effect unless one of the Station Message Detail Recording Options (272 and/or 273) is also enabled.
231	Verifiable Account Code Enable. If this option is enabled all account codes dialed would be verified with account codes that the Supervisor had entered.
232	Account Code Length = 4 Digits. If this Option is selected, the length or maximum length of an Account Code is 4 digits. This Option is only meaningful if Option 230 is also selected.
233	Account Code Length = 8 Digits. If this Option is selected, the length or maximum length of an Account Code is 8 digits. This Option is only meaningful if System Option 230 is also selected.
234	Account Code Length = 12 Digits. If this Option is selected, the length or maximum length of an Account Code is 12 digits. This Option is only meaningful if System Option 230 is also selected.
235	Variable Length Account Codes. If this option is selected, DTMF extensions and the Supervisor may enter an Account Code of less digits than the length defined by System Options 232/233/234. This is done by dialing a # as a delimiter. If this Option is not selected, only Account Codes of a fixed length, may be entered. This Option is not meaningful unless System Option 230 is also enabled.
NOTES	1. If neither 232, 233 or 234 is selected, the length of Account Codes is 5 digits 2. Only one of the Options 232, 233 or 234 should be selected. If more than one is set, the lowest is chosen.

SX-100* AND SX-200*
SUPERSWITCH*
AUTOMATIC CALL DISTRIBUTION SYSTEM
GENERAL MAINTENANCE INFORMATION
GENERIC ACD

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1. INTRODUCTION

General

1.01 This Section contains a brief description of the maintenance and diagnostic procedures used to maintain the SX-100 and SX-200 Electronic Private Automatic Branch Exchanges (ESystem's).

Reason for Issue

1.02 This Section has been issued to provide the SX-100/SX-200 Automatic Call Distribution (ACD) System 217 general maintenance information.

SUPERSET 4

1.03 For feature information on the SUPERSET 4 see Section MITL9105/9110-090-107-NA.

SUPERSET 3

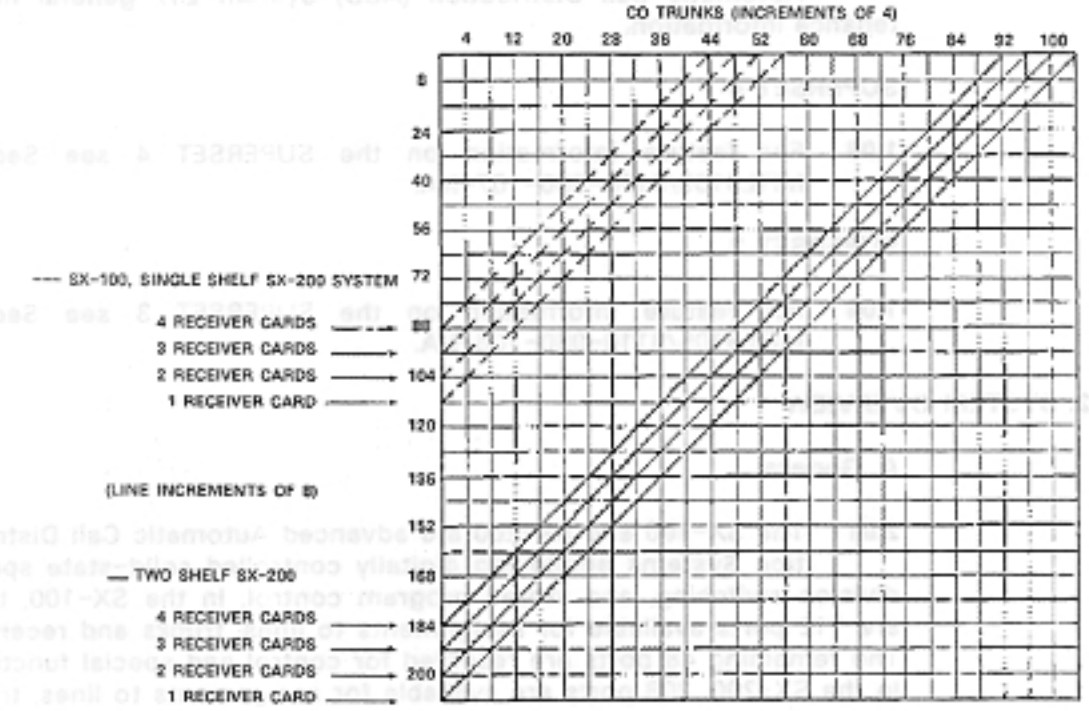
1.04 For feature information on the SUPERSET 3 see Section MITL9105/9110-090-106-NA.

2. SYSTEM OVERVIEW

A. General

2.01 The SX-100 and SX-200 are advanced Automatic Call Distribution Systems employing digitally controlled solid-state space-division switching, and stored program control. In the SX-100, there are 112 ports available for assignments to lines, trunks and receivers. The remaining 48 ports are reserved for control and special functions. In the SX-200, 208 ports are available for assignments to lines, trunks and additional receivers. There are 48 ports reserved for control and special functions. Figure 2-1 shows the maximum line and trunk configurations for the SX-100 and SX-200. The SX-100 and SX-200 are electrically compatible with most existing extension, key telephone, Private Branch Exchange (PBX) and Central Office (CO) equipment, and provides:

- The use of a flexible numbering plan.
- The simultaneous use of DTMF and rotary dial stations.
- Optional use of Supervisor consoles - two maximum.
- Extensive selection of standard and optional features.
- MITEL Recorded Announcement Card.
- Freedom from scheduled maintenance.
- Automatic diagnostics.



NOTES: LINES – 1 PORT REQUIRED PER LINE

TRUNKS – 2 PORTS/CO TRUNK
4 PORTS/E&M, TIE TRUNK
4 PORTS/DID, TIE TRUNK

RECEIVERS 2 RECEIVER CIRCUITS/DUAL RECEIVER CARD
4 RECEIVER CIRCUITS/QUAD RECEIVER CARD

MAXIMUM OF 64 SUPERSET's PER SYSTEM.

X02R4

Figure 2-1 Maximum Line and Trunk Configuration

- Six power fail transfer trunks (SX-100).
- Twelve power fail transfer trunks (SX-200).
- Optional reserve power supply.
- SUPERSET 4.
- SUPERSET 3.

2.02 **Maximum Line and Trunk Configuration.** The SX-100 and SX-200 each consist of a single cabinet (containing the switching circuitry and the system power supplies) and a cordless desk-type Supervisor console equipped with pushbutton dialpad and control keys. Connections between the equipment cabinet, the console, and the distribution frame are made using connectorized 25-pair cables. A maximum of 64 SUPERSETs may be used on either system.

2.03 Noiseless operation, exceptionally small size, and environmental tolerance allow a wide choice of locations for the equipment.

Maintenance

2.04 The modular design and functional packaging of the systems permit rapid location and replacement of defective equipment. Circuit malfunctions are detected by diagnostic routines automatically initiated by the CPU. These diagnostic routines are detailed in Section MITL9105/9110-090-350-NA. The use of MITEL Action Procedures (MAP's) helps to locate the defective circuit card or assembly, in order to indicate to the service personnel the required field-replaceable unit. Diagnostic routines and maintenance procedures do not interfere with users not affected by the malfunction. Because the system employs only electronic circuits, preventative maintenance is not required.

2.05 System expansion is achieved by the addition of plug-in line and trunk printed circuit cards. Lines are added in increments of eight, CO trunks in increments of four and special trunks in increments of two. SUPERSET lines are added in increments of eight.

Physical Description

2.06 The SX-100 and the SX-200 equipment cabinets are of metal construction, and are shown in Figure 2-2 and 2-3.

2.07 All connections from the cross-connecting terminals to the System equipment cabinet are made using connectorized cables. Connections between the cross-connecting terminals, the Supervisor console and external equipment are made in accordance with accepted practice.

2.08 A reserve power supply and battery charging system are available as an option. The reserve power supply is designed to maintain system operation for a minimum of two hours in the event of a primary power failure. These items can be mounted within the SX-

200 cabinet, but are packaged into a shelf that forms a pedestal for the SX-100.

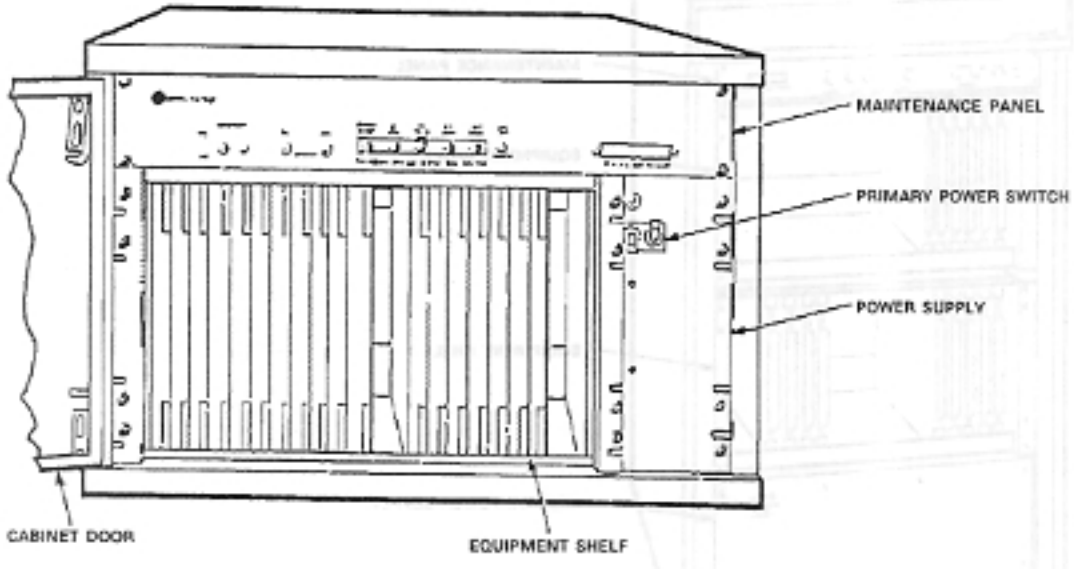
SX-100 Equipment Cabinet

2.09 The door on the front of the SX-100 cabinet provides access to the system maintenance panel and the printed circuit cards (Figure 2-2). The removable rear panel provides access to the system power supply, and the line and trunk connections. Cable entry to the equipment cabinet is provided through a cable duct in the rear of the cabinet. The maintenance panel, mounted at the top of the cabinet, provides access to the system from the maintenance console through a 50-pin connector. To the left of the maintenance plug is the master power fail transfer switch, five power fail transfer control switches, and the system POWER ON/OFF switch. In addition, a test line is provided which allows service personnel to access individual lines and trunks. Mounted directly below the maintenance panel is the equipment shelf. This shelf contains the system common control cards, plus a number of trunk, line, and receiver cards. The optional reserve power supply is contained in a separate unit that the equipment cabinet may sit on.

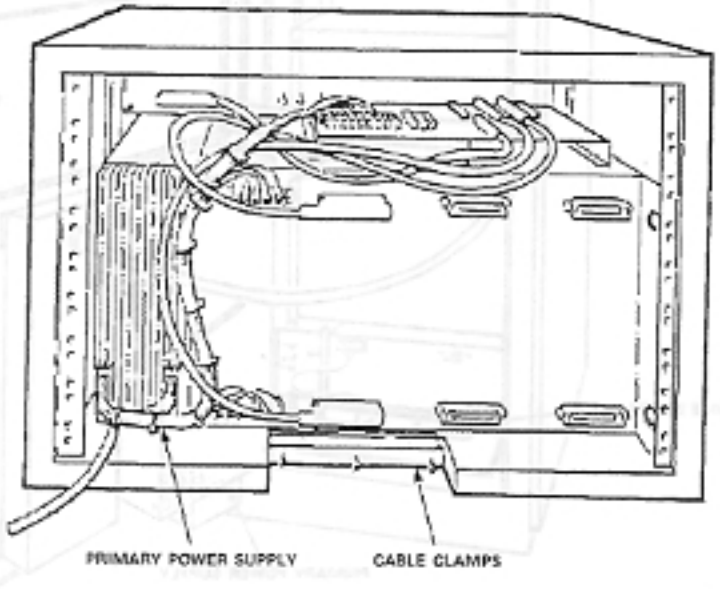
SX-200 Equipment Cabinet

2.10 The door on the front of the cabinet provides access to the system maintenance panel, printed circuit cards and reserve battery supply shelf (Figure 2-3). The hinged rear panels hold the system power supply, and provide access to the line and trunk connections, and the reserve power controls. Cable entry to the equipment cabinet is provided through cable ducts on either side of the cabinet.

2.11 The equipment cabinet holds the maintenance panel, a maximum of two equipment shelves, the optional reserve battery supply, and the primary power supply. The maintenance panel, mounted at the top of the cabinet, provides access to the system from the maintenance console through a 50-pin connector. To the left of the maintenance plug is the master power fail transfer switch, five power fail transfer control switches and the system POWER ON/OFF switch. In addition, a test line is provided which allows service personnel to access individual lines and trunks. Mounted directly below the maintenance panel is equipment shelf 2. This shelf holds line and/or trunk cards. Below equipment shelf 2 is equipment shelf 1. This shelf contains the system common control plus a number of trunk, line, and receiver cards. The optional reserve power supply is contained in a completely enclosed shelf located at the bottom of the cabinet. All connections between shelves and external equipment are made by connectorized cables from the rear of each shelf. The system primary power supply, held on the lower hinged back panel of the cabinet, converts the commercial input power to the required system voltage levels.



FRONT VIEW



REAR VIEW

WEIGHT	HEIGHT	WIDTH	DEPTH
70 lb (31.8 kg)	16.62 in. (422 mm)	25.0 in. (635 mm)	18.5 in. (470 mm)

X5611

Figure 2-2 SX-100 Equipment Cabinet

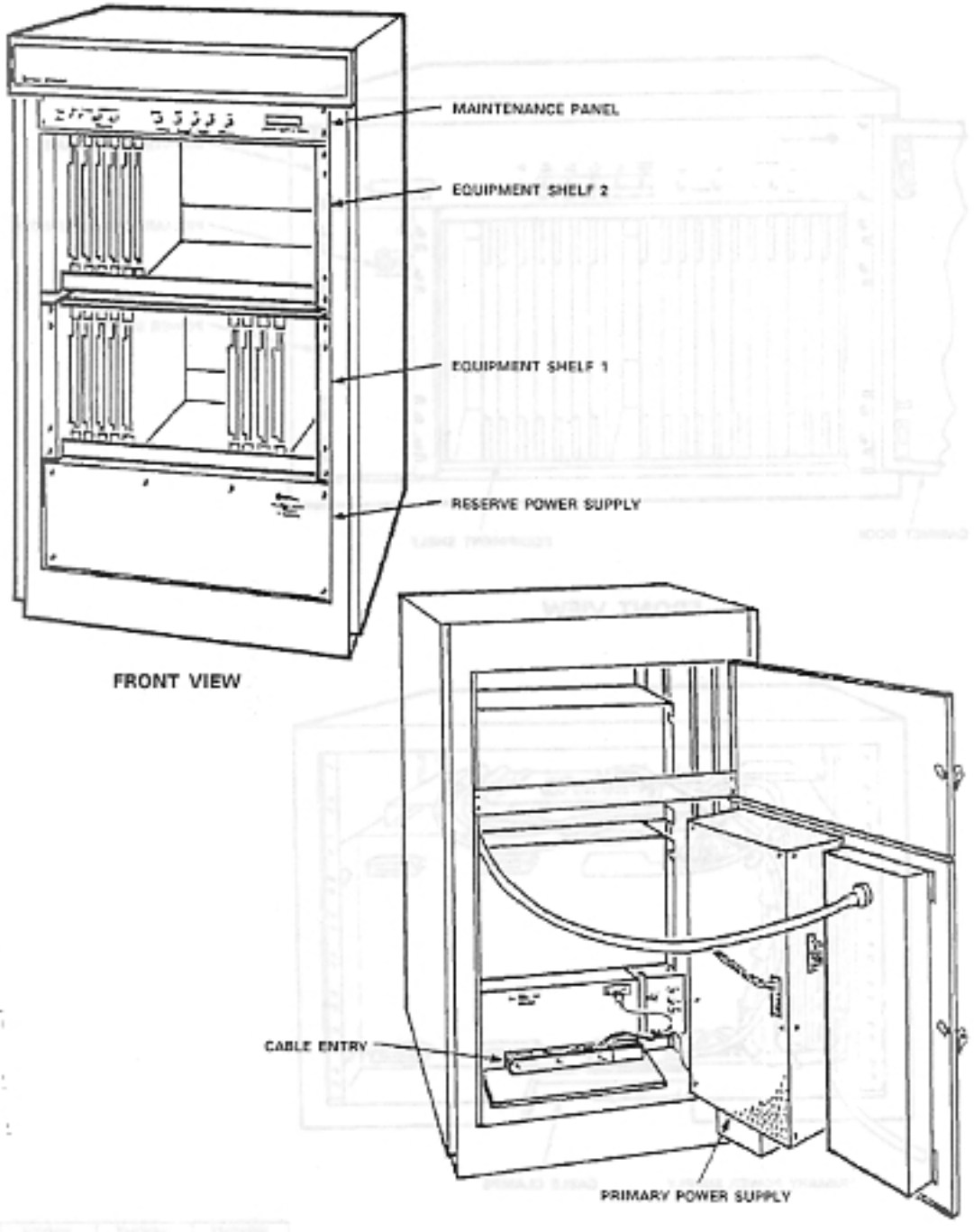


Figure 2-3 SX-200 Equipment Cabinet

Maintenance Panel

2.12 The plug on the right of the maintenance panel permits the service personnel to perform maintenance tasks and enter new, or modify existing customer data using the maintenance console. The test line terminals on the panel allow the use of a standard hand test-set (butt-in) to establish calls through the system using preselected circuits.

Equipment Shelves

2.13 The equipment shelves used in the SX-100 and SX-200 are identical, and hold up to 21 printed circuit cards which plug into the shelf backplane. On the rear of the backplane are a number of 25-pair plugs providing interconnections between the shelves and external equipment. In addition to the plugs are a number of screw-down terminals allowing shelf connection to the primary power supply unit. The equipment shelves (Figure 2-4) measure 10.75 in. (273 mm) high, 19 in. (480 mm) wide, 16,37 in. (415 mm) deep and weigh approximately 27 lb (12.2 kg) fully equipped.

Printed Circuit Cards

2.14 All circuit cards (Figure 2-5) used in the System's are identical in construction and consist of a fiberglass board with printed wiring patterns on both of its faces. Riveted to the front of each board is a transparent faceplate which allows the LED's mounted on the front of the boards to be easily seen. The two color-coded card extractors, located at the top and bottom of the faceplate, identify the card position within a shelf and ensure that the card is seated correctly in the backplane connector.

Primary Power Supply

2.15 The system primary power supply (Figure 2-6 and 2-7), provides all system power from a 115 Vac. In the SX-200, optional factory strapping allows for 220 Vac operation. The SX-100 has a 220 Vac adapter to allow 115 Vac power to the system.

Electrical Characteristics

2.16 The electrical characteristics of the SX-100 and SX-200 are listed in Table 2-1.

2.17 Both System's are designed to operate from a 48 Vdc source. A 48 Vdc power supply operating from commercial power is standard equipment. The systems may be optionally equipped with a charger and battery arrangement which provides a minimum of 2 hours reserve power in the event of commercial power failure.

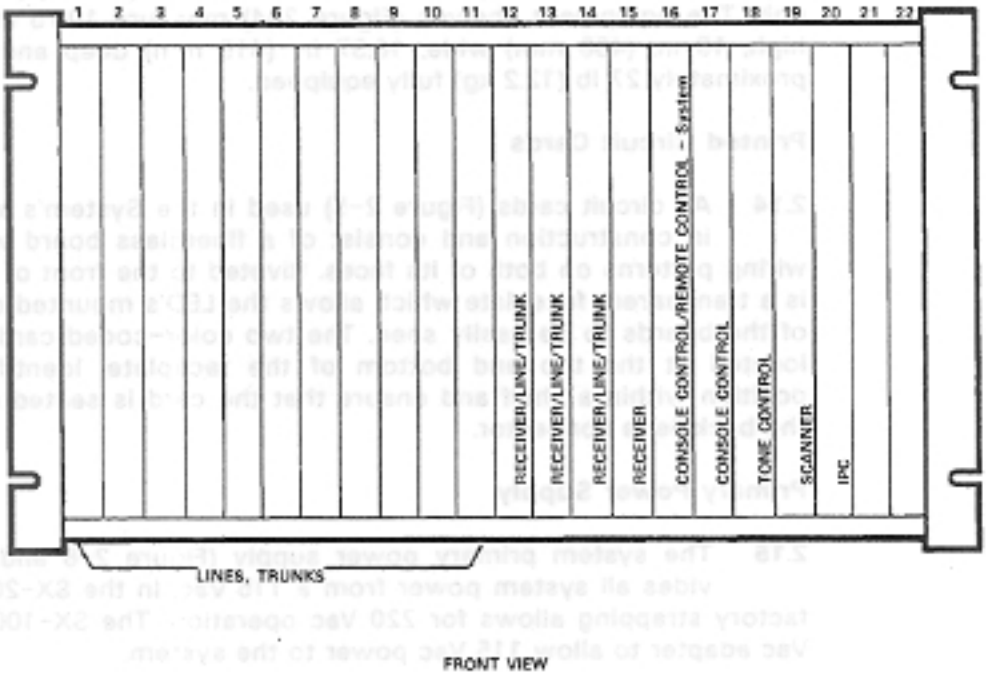


Figure 2-4 Equipment Shelf

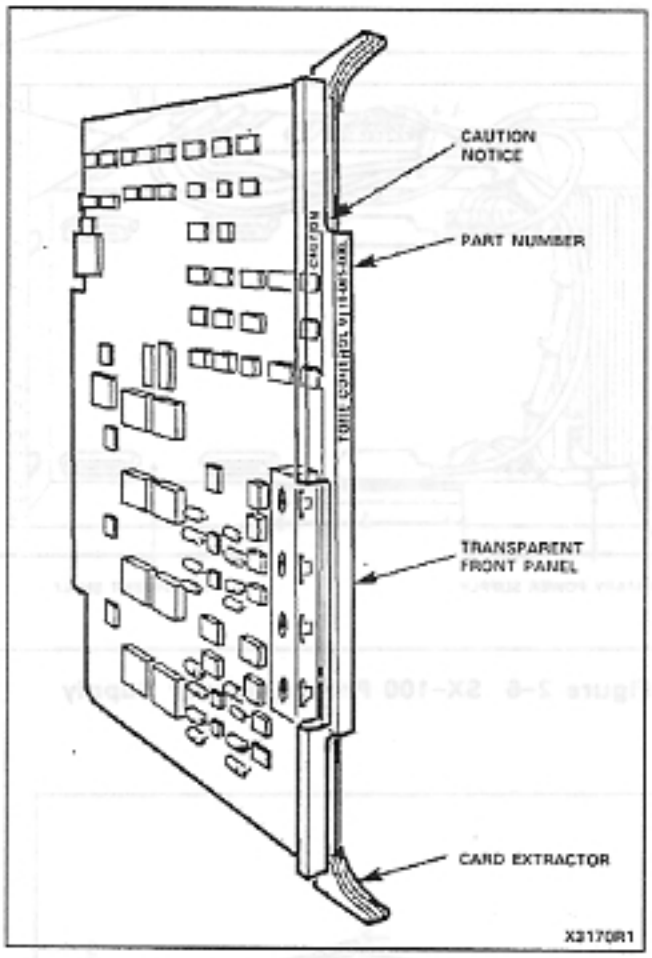


Figure 2-5 Printed Circuit Card

2.18 In the event of a power failure with no reserve power available, up to six SX-100 or twelve SX-200 Central Office (CO) trunks can be arranged to be automatically connected to preselected extensions.

Supervisor Console

2.19 The SX-100/200 Supervisor console (Figure 2-8) is enclosed in a housing with a smoked plastic cover. Located on either side of the console are a pair of headset/handset jacks allowing simultaneous operation and supervision. The console keyboard holds three rows of ten nonlocking keys (with indicating LED's) for the selection of features and completion of calls. On the right of the keyboard is a 12-key pushbutton dial pad. The console display, mounted above the keyboard, displays the active states of calls in progress. In addition to the call status display is a busy lamp field, a trunk group status field, a call waiting indicator, a digital clock, and three alarm indicators. The weight of the Supervisor console is approximately 5 lb (2.3 kg) and its dimensions are: 13.75 in. (350 mm) wide, 6.8 in. (176 mm) high, and 9.25 in. (236 mm) deep. A complete description of the Supervisor consoles is given in Section MITL9105/9110-090- 315-NA.

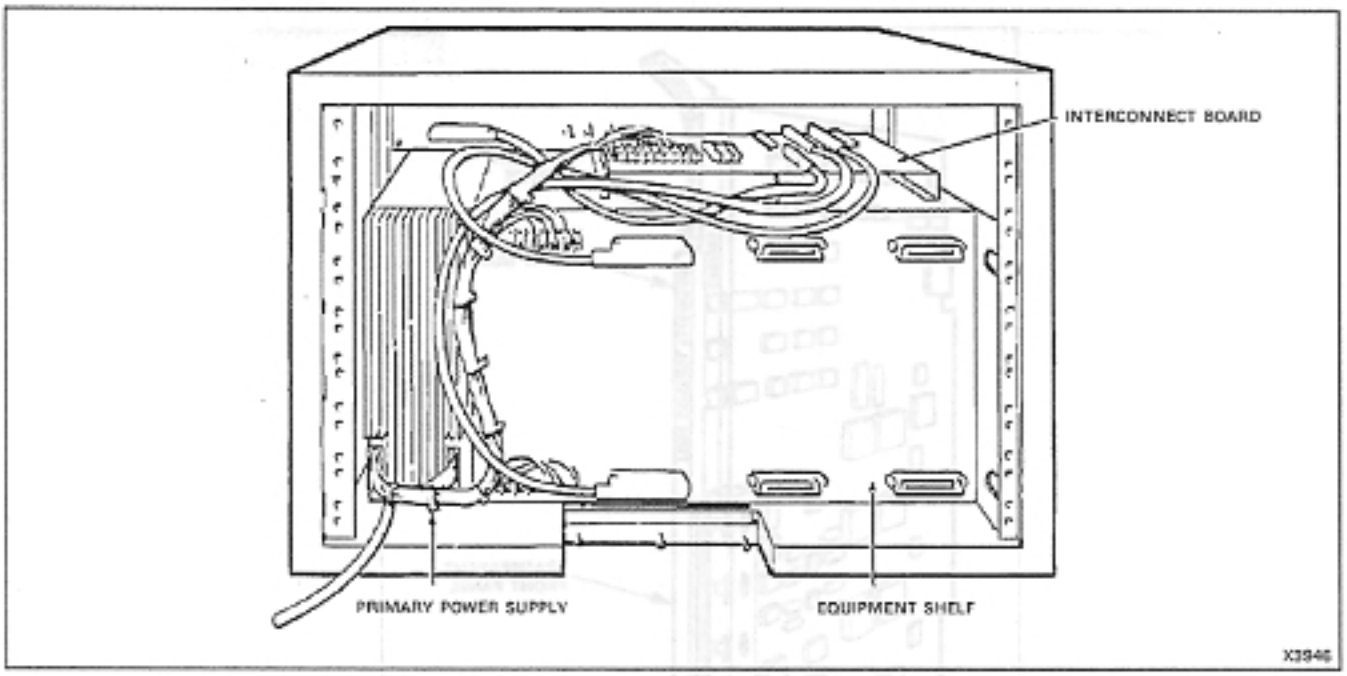


Figure 2-6 SX-100 Primary Power Supply

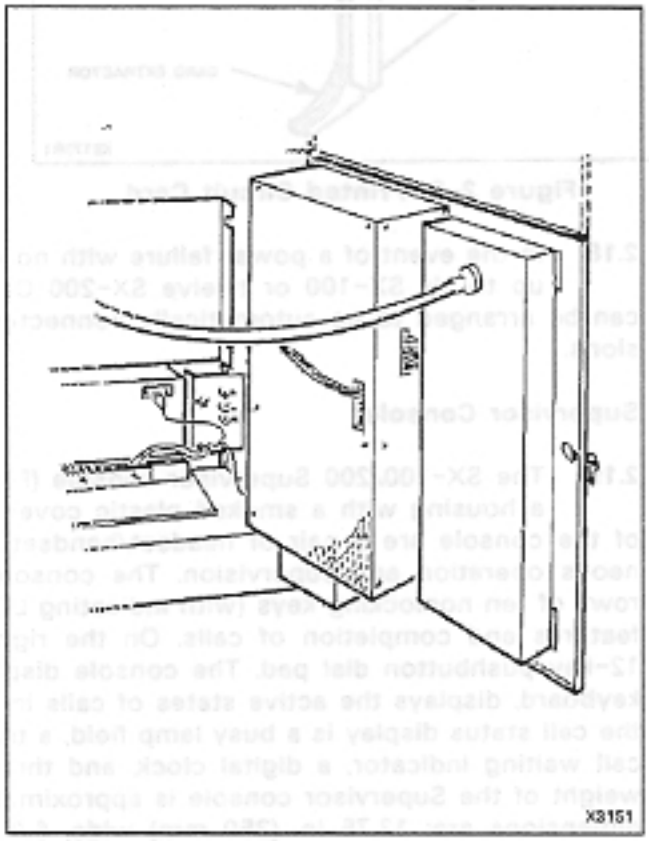


Figure 2-7 SX-200 Primary Power Supply

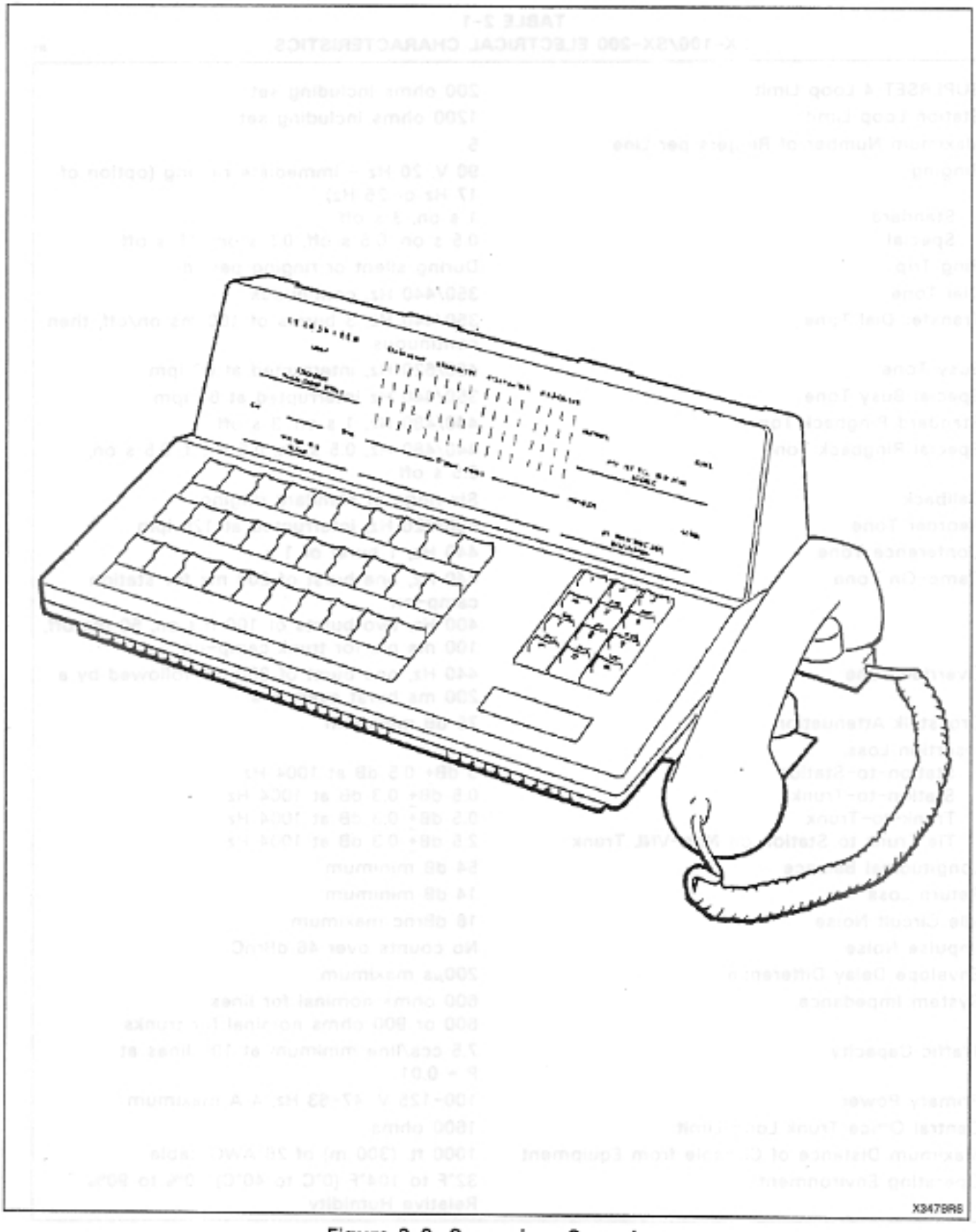


Figure 2-8 Supervisor Console

TABLE 2-1
SX-100/SX-200 ELECTRICAL CHARACTERISTICS R1

SUPERSET 4 Loop Limit	200 ohms including set
Station Loop Limit	1200 ohms including set
Maximum Number of Ringers per Line	5
Ringing	90 V, 20 Hz - immediate ringing (option of 17 Hz or 25 Hz)
Standard	1 s on, 3 s off
Special	0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
Ring Trip	During silent or ringing period
Dial Tone	350/440 Hz, continuous
Transfer Dial Tone	350/440 Hz, 3 bursts of 100 ms on/off, then continuous
Busy Tone	480/620 Hz, interrupted at 60 ipm
Special Busy Tone	350/440 Hz interrupted at 60 ipm
Standard Ringback Tone	440/480 Hz, 1 s on, 3 s off
Special Ringback Tone	440/480 Hz, 0.5 s on, 0.5 s off, 0.5 s on, 2.5 s off
Callback	Six rings of standard ringing
Reorder Tone	480/620 Hz, interrupted at 120 ipm
Conference Tone	440 Hz, 1 burst of 1 s
Camp-On Tone	440 Hz, one burst of 200 ms for station camp-on 400 Hz, two bursts of 100 ms on, 50 ms off, 100 ms on, for trunk camp-on
Override Tone	440 Hz, one burst of 800 ms followed by a 200 ms burst every 6 s
Crosstalk Attenuation	75 dB minimum
Insertion Loss,	
Station-to-Station	5 dB± 0.5 dB at 1004 Hz
Station-to-Trunk	0.5 dB± 0.3 dB at 1004 Hz
Trunk-to-Trunk	0.5 dB± 0.3 dB at 1004 Hz
Tie Trunk to Station on Non-VNL Trunk	2.5 dB± 0.3 dB at 1004 Hz
Longitudinal Balance	54 dB minimum
Return Loss	14 dB minimum
Idle Circuit Noise	16 dBrnc maximum
Impulse Noise	No counts over 46 dBrnC
Envelope Delay Difference	200μs maximum
System Impedance	600 ohms nominal for lines 600 or 900 ohms nominal for trunks
Traffic Capacity	7.5 ccs/line minimum at 100 lines at P = 0.01
Primary Power	100-125 V, 47-63 Hz, 4 A maximum
Central Office Trunk Loop Limit	1600 ohms
Maximum Distance of Console from Equipment	1000 ft. (300 m) of 26 AWG cable
Operating Environment	32°F to 104°F (0°C to 40°C) 10% to 90% Relative Humidity

Programming and Maintenance Console

2.20 The construction of the programming and maintenance console is identical to that of the Supervisor console; the only difference is in the functions of the call and feature selection keys. A complete description of the maintenance console is given in Section MITL9105/9110-096-315-NA.

Features

2.21 The System features are provided in the form of feature packages (Generics). For a detailed description, refer to Section MITL9105/9110-090-105-NA. SUPERSET 4 features are listed in Section MITL 9105/9110-090-107-NA. SUPERSET 3 features are listed in Section MITL9105/9110-090-106-NA.

3. SYSTEM OPERATION

3.01 The systems are solid-state System's employing space-division switching and microprocessor control of call processing. A block diagram of the System is shown in Figure 3-1.

3.02 The SX-100 has a capacity of 112 ports and the SX-200 of 208 ports, which may be assigned to receivers, lines, and trunks. The ports are scanned sequentially for detection of signals every 3.2 ms.

3.03 Call origination is detected during scanning, an interrupt signal to the microprocessor is generated, and a speech path and receiver are assigned to the originating station. After dialing, the receiver is released and the called party is connected to the same speech path as the originator. There are 31 speech paths available and each of the ports has access to all 31 speech paths.

4. MAINTENANCE

A. General

4.01 The System contains no moving parts and therefore requires no routine preventative maintenance. The sole item requiring periodic maintenance is the Random Access Memory Battery Pack (PN9110-020-000) which should be changed at 4 year intervals. In the event of a malfunction, the system design allows for the rapid location and replacement of the suspect item. Maintenance features include:

- power-up diagnostics,
- automatic diagnostics,
- dynamic diagnostics,
- low number of cards,

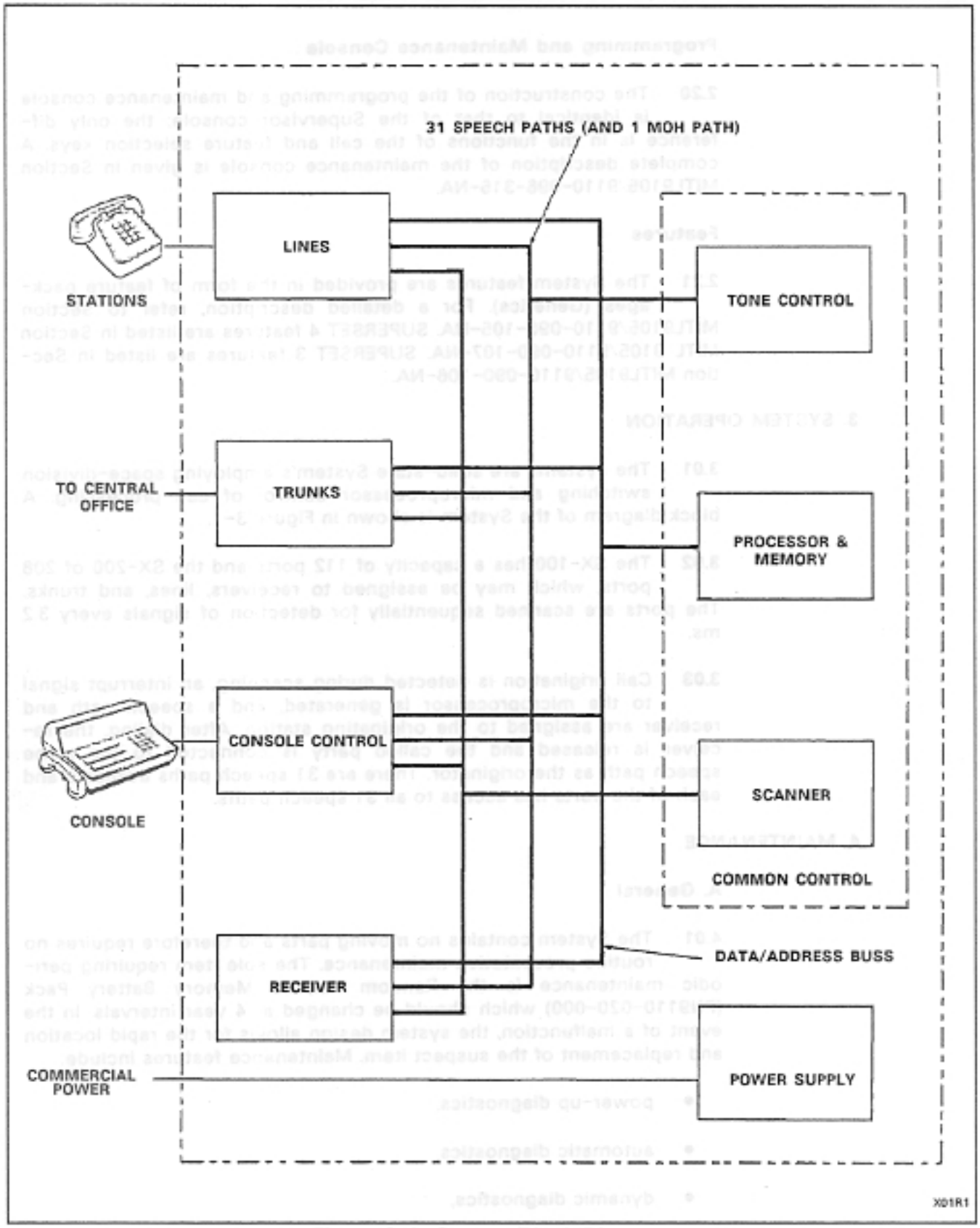


Figure 3-1 System Block Diagram

- low number of card types,
- power fail transfer control switches,
- status LED's on most cards,
- busy switches and LED's on trunk cards,
- fault readout on the console,
- test line, and
- console clock.

4.02 The system maintenance philosophy assumes that faulty printed circuit cards or assemblies are replaced in the field, the faulty items being returned to MITEL for repair.

B. Power-Up Diagnostics

4.03 Each time power is applied to the system, the Power-Up Diagnostics check the Random Access Memory (RAM), the Programmable Read Only Memory (PROM), and the Non-Volatile Random Access Memory. The RAM is checked by setting all bits to 1, then to 0, and a check is performed to ensure that each bit is set correctly. If an error is detected, a major alarm is raised. The PROM check consists of compiling a checksum of all the PROM bits and comparing the result with the checksum produced when the PROM was manufactured. A difference in the two checksums will result in a major alarm. The Non-Volatile RAM check consists of compiling a checksum of all the bits in the Non-Volatile RAM and comparing this with the checksum generated when the Non-Volatile RAM was last programmed. A difference in the checksums will result in a minor alarm.

4.04 During the power-up sequence, the scanner operation is also checked. If a malfunction is detected, a major alarm is raised. If the system powers up correctly, the console clock displays 00.00 and starts to run.

C. Automatic Diagnostics

4.05 The Automatic Diagnostics test the speech path connections, tone and rotary receivers, tone and rotary generators, supervisory tones, and speech path biasing. The automatic diagnostics run at all times except when there are four or less speech paths free in the system, or when a console is in the programming mode. The diagnostics will not use a receiver if any other equipment is waiting for a receiver.

4.06 Faults found are reported as minor alarms, and the failing unit is busied-out, if possible. The automatic diagnostics will not busy out more than half the receivers, generators, or speech paths, to guard against the possibility that an error in the fault detection circuitry could shut down the system.

4.07 **Organization.** The automatic diagnostics consist of a set of test routines called from a sequencer. The sequencer picks a free speech path and calls a set of tests. It then picks the next free speech path and calls the set of tests. When it has done this for all the free speech paths from 1 to 31, it makes a new similar pass and keeps repeating this procedure.

4.08 Some tests (the quick ones) are performed for each speech path. Other slower ones are performed only once per pass (e.g. on speech path 1 in pass 1, on speech path 2 in pass 2, etc.). One normal pass of the diagnostic takes 13 seconds X the number of receivers, when the system is idle. This applies to the first 16 passes. The next 16 take only 4 seconds each because the Receiver and Generator test is skipped. After the first normal pass, all supervisory tone generators, DTMF generators, and receivers will have been checked on at least one speech path, all speech paths will have been tested for shorts, and the speech path connections to the card in slot 1 will have been tested. Approximate times are:

	4 receivers	8 receivers	16 receivers
1 normal pass	1 min	2 mins	4 mins
31 passes	15 min	30 min	60 min

Tests Performed Each Time

4.09 **Basic Speech Path:** The basic speech path check is as follows:

(a) The speech path test circuit is checked to see that it reads "high" when not in use. Detection of a malfunction results in ERROR 004 – all self-testing stops.

(b) The speech path under test is checked, using the speech path test circuit to see that it is "high" (i.e. not connected to anything). Detection of a malfunction results in ERROR 018 – speech path busied out – sequencer picks next speech path.

4.10 **Speech Path Short and Bias Check:** The speech path short and bias check is as follows:

(a) All idle speech paths other than the speech path under test, are checked using the speech path circuit to see if any are not "high". The result of this is used in (c) below.

(b) Speech path bias is applied to the speech path under test, and it is checked using the speech path test circuit to see that it goes to "0". Detection of a malfunction results in ERROR 005 – speech path busied out – sequencer picks next speech path.

(c) If all other speech paths were "high" when checked in (a), they are all checked again to see that none went to "0", which would indicate a short to the speech path under test. Detection of a

malfunction results in ERROR 006 – speech path under test busied out – sequencer picks next speech path.

4.11 **Supervisory Tones:** The supervisory tones – speech path connection check is as follows:

(a) For internal reasons, this test is only run if all other speech paths are idle.

(b) Each supervisory tone, in turn, is connected to the speech path under test, and the speech path test circuit used to check that the speech path goes to "0". Detection of a malfunction results in ERROR 007 – speech path busied out – sequencer picks next speech path.

4.12 **Speech Path Connection Test:** The lines – speech path connection test is as follows:

(a) The sequencer initially sets the self-test function to test slot 1 in this test. At the end of each pass through the speech path, the slot number is incremented by the sequencer. After 31 passes, all possible slots will have been tested.

(b) Each of the possible eight lines in the slot is checked to see if it has been programmed as a station or trunk. If so, and the line is currently idle, the line is connected to the speech path under test, which is then checked using the speech path test circuit to see that it is now at "0". If it is not at "0", it could be that the line has just gone on- or off-hook, so the test is repeated up to two more times at 50 ms intervals. If it does not got to "0", and the line is still idle (i.e. the system has not detected an off-hook), then this will cause ERROR 012 – no more tests will be performed on this slot in this or subsequent passes.

4.13 **Memory Test:** A small section of memory is tested each time, so that all memory will have been tested after 31 passes. The tests are similar to those in the Power-Up Diagnostic, except that the errors are reported, as MINOR. Once a memory error has been reported, no more memory testing takes place until the diagnostics are restarted by a system reset.

Tests Performed Once per Pass

4.14 **Supervisory Tones:** Supervisory Tone – Tone Presence Test:

(a) This test is skipped if a supervisory tone presence error was detected previously.

(b) The dial tone detector on the receiver is used to detect tone presence.

(c) One pair of receivers is picked, the pair changing each pass. If either receiver is busied-out or no receiver card exists, the test is skipped.

(d) The test is performed once per pass for dial tone.

(e) Using each of the two receivers in turn, the test waits for the receiver to become free, then connects it and the tone to the speech path under test. After 350 ms, the dial tone detector is checked to see if it has detected the tone.

(f) If neither receiver detected the tone, it is assumed to be missing. Detection of a malfunction results in ERROR 013 – testing for supervisory tone presence is no longer performed.

(g) If one receiver detected the tone but the other did not, it is assumed that the tone is present but one receiver is faulty. This results in ERROR 014 – receiver is busied out.

4.15 **Receiver and Generator:** The receiver and generator test is as follows:

(a) This test uses both the speech path under test and the 15th higher speech path. If the speech path under test is numbered 17–31, the test is skipped.

(b) If any tone generator has been busied out, this test is skipped.

(c) The receiver and generator test is performed for each of four tone digits ("1, 5, 9, a") and for the rotary digit "6". It is also performed for each pair of receivers in the system. If either has been busied out or if the receiver card is not present, the test for that pair is skipped.

(d) Each digit is sent eight times, using all combinations of the two receivers, two speech paths, and two generators. If any errors are detected, they are analyzed to see if they correspond to a single receiver, speech path or generator error. If they do, the error is reported as follows:

ERROR 008 (receiver, tone, error)
ERROR 009 (receiver, rotary, error)
ERROR 010 (generator error)
ERROR 011 (error isolated to a speech path)

If it is not possible to isolate which unit has failed, the error is reported as ERROR 015 – probable receiver error. The generator is busied out to ensure that the error is not re-reported in each pass.

(e) Errors 008–010 result in the receiver or generator being busied out. Error 011 could be either on the receiver card or the generator card (tone control card) so no device is busied out.

D. Dynamic Diagnostics

4.16 Each time an extension goes off-hook or a trunk rings in, it is connected to a speech path. The dynamic diagnostics check the speech path to ensure that the speech path connection is good. If a bad path is detected, the processor assigns a new speech path and rechecks the connections. If, after four attempts, the speech path still tests bad, it is assumed that the test sequence is at fault and the connection is maintained. The automatic diagnostics will detect any bad speech path and raise the required alarm condition.

E. Circuit Cards

4.17 Both the SX-100 and SX-200 employ a minimum number of different types of cards (Figure 4-1), which may be used in either system minimizing stocking and control problems for field maintenance. The cards used in the system are described in the following paragraphs.

4.18 **IPC Card.** This printed circuit card contains the system 40 k/byte scratch pad Random Access Memory. It is used for the storage of customer configuration data (Class of Service options, numbering plan etc.) (see Figure 4-2). This card also holds four diagnostic LED's:

- The top LED, when flashing, indicates that the automatic diagnostics are running. This LED will not flash (the diagnostics do not run) when the system is in the programming mode, or when less than four speech paths are idle. Under these circumstances, the LED may be either on or off; its state has no special meaning.
- The second LED, when lit, indicates that the system is in the programming mode.
- The third LED, when lit, indicates that the RS232 port is in use.
- The fourth LED, when lit (or flashing), indicates that the system is functioning normally.

The IPC card contains the system Generic program in Programmable Read Only Memory (PROM), and also contains the microprocessor, which together with the Generic program constitutes the intelligence of the System. The basic system clock is also located on this card (see Figure 4-2).

4.19 **Line Card.** The line card contains eight separate line circuits. The line circuit detects on- and off-hook conditions, which are recognized by the scanner, and reported to the processor for appropriate action. Dial signals (rotary dial or DTMF) are passed to a receiver over the speech path selected for the conversation (see Figure 4-2). This card is not compatible with SUPERSET telephone sets.

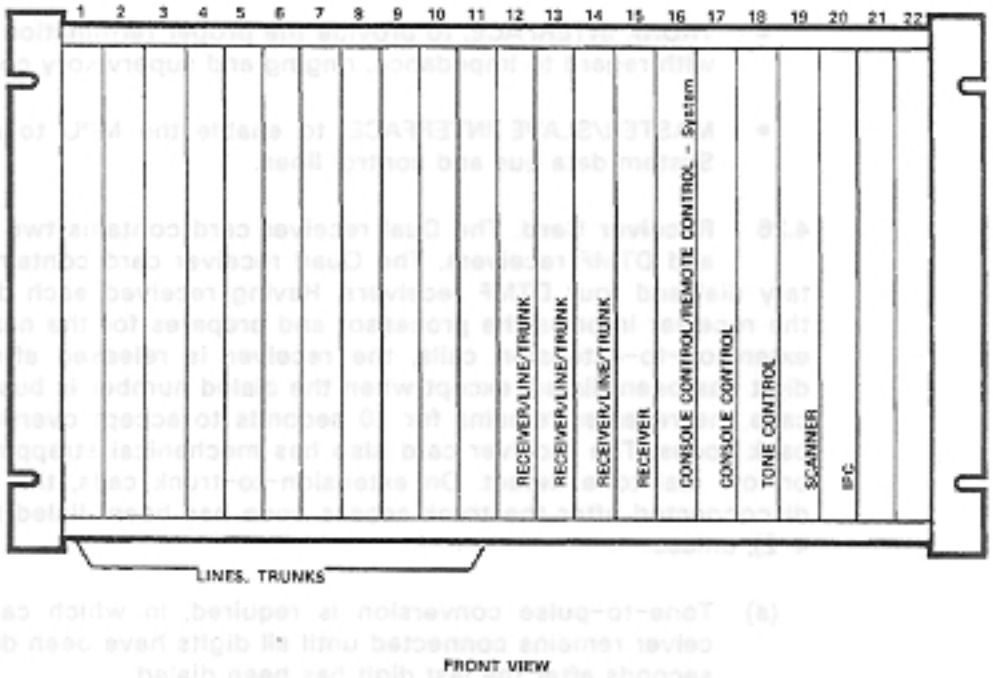
4.20 **Trunk Card.** The trunk card contains either two or four trunks depending on trunk type (four CO trunks, two E&M trunks, or two DID trunks). These circuits provide the interface between the System and the Central Office or other System's. Each trunk circuit repeats dial pulse signals from the speech path to the Tip and Ring, and passes DTMF signals directly from the speech path to the Tip and Ring for outgoing calls. The busy switches on the trunk card may be used to make a trunk continuously busy. If the trunk is in use when the switch is set, the existing call is not disturbed, but the trunk is made busy as soon as the call ends. The trunk may also be busied out from the Supervisor console (see Figure 4-3).

4.21 **SUPERSET Line Card.** The SUPERSET 3 or 4 requires a SUPERSET line card, which is not compatible with standard telephone sets. The card contains eight separate line circuits with eight LED's indicating on/off-hook conditions. The line circuits act as interfaces between the SUPERSET's and the system CPU (Central Processor Unit). The system processor continually polls all line circuits to determine calls for service, time updates, messaging, etc. No actual dial signals are sent between the SUPERSET and the system, as all communication is digitally sent.

4.22 **Scanner Card.** The basic function of the scanner card is to sequentially scan each port (line, trunk, console, receiver), in order to detect signals requiring processor action. If such a signal (e.g. off-hook from a line circuit) is detected, the scanner informs the processor of the port involved. The processor then takes over any subsequent action required. Additional functions of the scanner card include a 2-digit alarm display which identifies any malfunctioning card, the master reset button, and a data speed (300 or 1200 baud) selector switch for the RS232 interface. There is also a set of switches to set the character length, stop bits and parity. In addition to the above, the relays for night service, and night bells 1, 2 and 3 are located on this card (see Figure 4-2).

4.23 **Tone Control Card.** This card provides the tone generators for dial tone, busy tone, reorder tone, ringback tone and miscellaneous tone, along with two DTMF generators and two rotary dial generators which are used by the diagnostic routines and the Supervisor. The four thumbwheel switches used with the test line and programming are also located on the tone control card. In addition, the circuits for Page 1 and Page 2 outputs, and the Music on Hold Input are located on this card (see Figure 4-2).

4.24 **Console Control Card.** The console control card provides the interface between the System and two consoles. Console control card number 1 (position 17) is allocated to the maintenance console connector and the Supervisor console number 1 connector. Console control card number 2 (position 16) is allocated to the Supervisor console number 2 connector. The card provides both voice and data signals to and from each console (see Figure 4-2).



SHELF 1

X5619

Figure 4-1 Equipment Card Locations

4.25 Remote Control System. The Remote Control System (RCP) card (Figure 4-2), can be fitted in slot 16 of the System shelf to provide the System console button functions remotely, under the control of the RMAT Controller (see Section MITL9105/9110-98-101-NA). The main components of the RCP card are as follows:

- The Micro-Processor Unit (MPU), which acts on commands received from the RMAT Controller via the modem.
- MEMORY PROM/RAM, which contains programmed memory and scratch-pad memory for storage and execution of commands.
- MODEM, which provides the necessary tone transmitter and receiver, and contains the handshaking circuitry required to interface the MPU with the external 2-wire line.
- TRUNK INTERFACE, to provide the proper termination to the line with regard to impedance, ringing and supervisory condition.
- MASTER/SLAVE INTERFACE, to enable the MPU to access the System data bus and control lines.

4.26 Receiver Card. The Dual receiver card contains two rotary dial and DTMF receivers. The Quad receiver card contains four rotary dial and four DTMF receivers. Having received each dialed digit, the receiver informs the processor and prepares for the next digit. On extension-to-extension calls, the receiver is released after the last digit has been dialed, except when the dialed number is busy, in which case the receiver remains for 10 seconds to accept override or call-back codes. The receiver card also has mechanical strapping for high or low dial tone detect. On extension-to-trunk calls, the receiver is disconnected after the trunk access code has been dialed (see Figure 4-2), unless:

(a) Tone-to-pulse conversion is required, in which case the receiver remains connected until all digits have been dialed, or 10 seconds after the last digit has been dialed.

(b) Toll restriction ARS or SMDR is provided, in which case the receiver remains connected until the call is either denied or allowed depending on the toll restriction provided and the digits dialed.

4.27 RAC The Recorded Announcement Card (RAC) occupies one peripheral slot in the system and provides two different 8-second recordings using digital solid-state storage. Messages are recorded on the supervisor's console. If required the two 8-second messages may be linked to provide one 16-second message. In the front faceplate of the card there are eight dipswitches. The first four switches may be used to busy out a particular channel (2 channels per recording). The fifth and seventh switch are the write protect switches. These switches may be set to disable recording. In addition there are

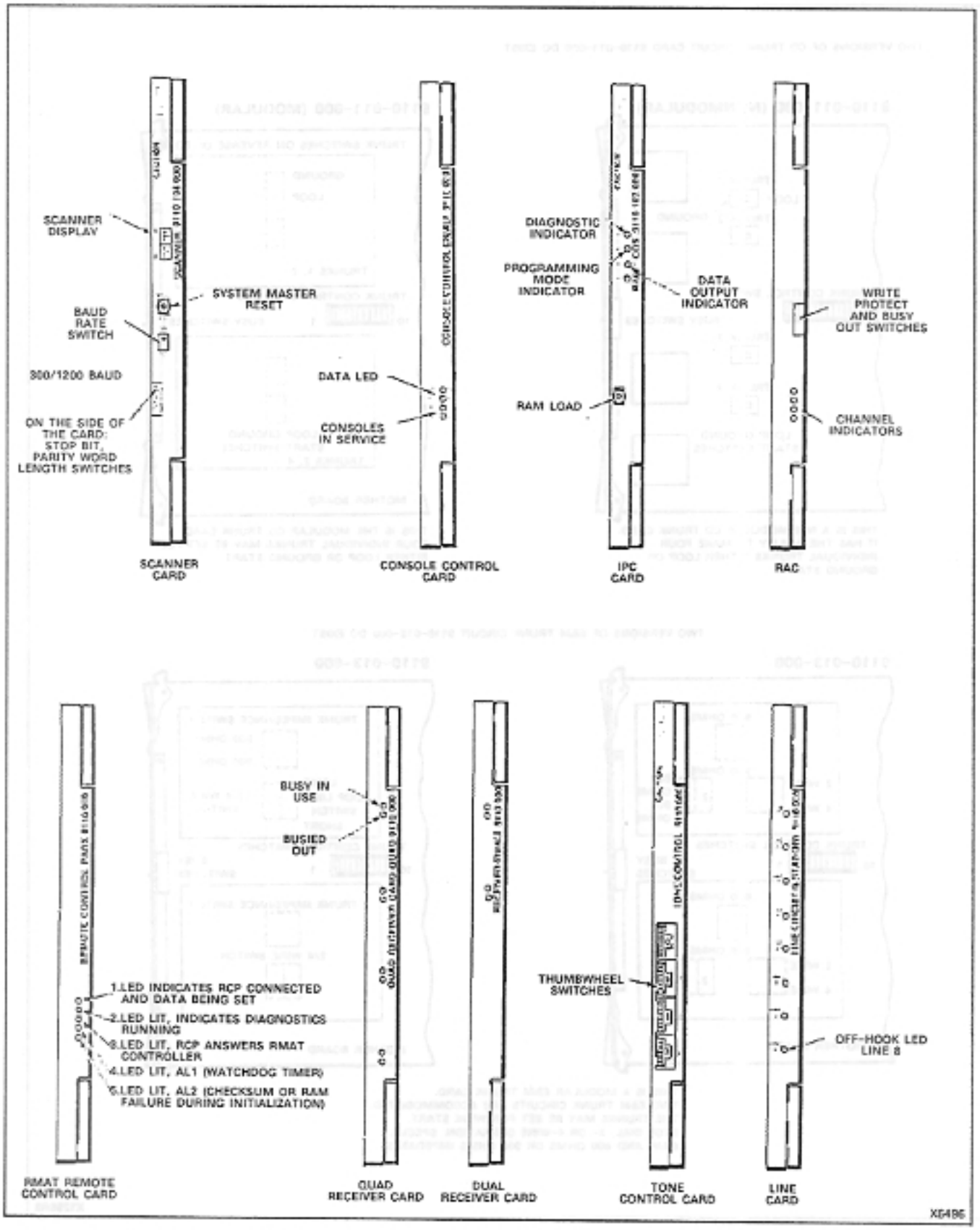


Figure 4-2 Circuit Cards

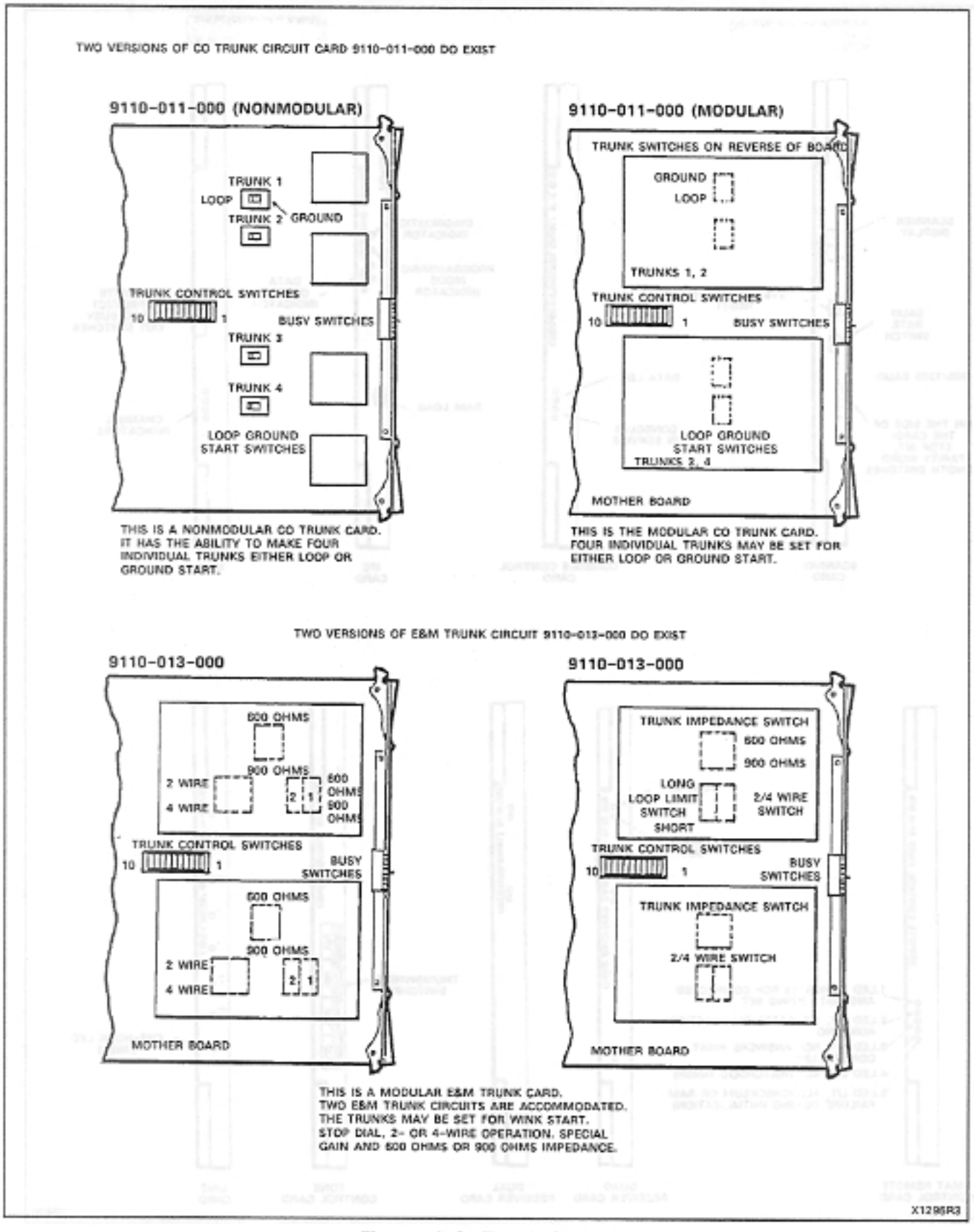


Figure 4-3 Trunk Cards

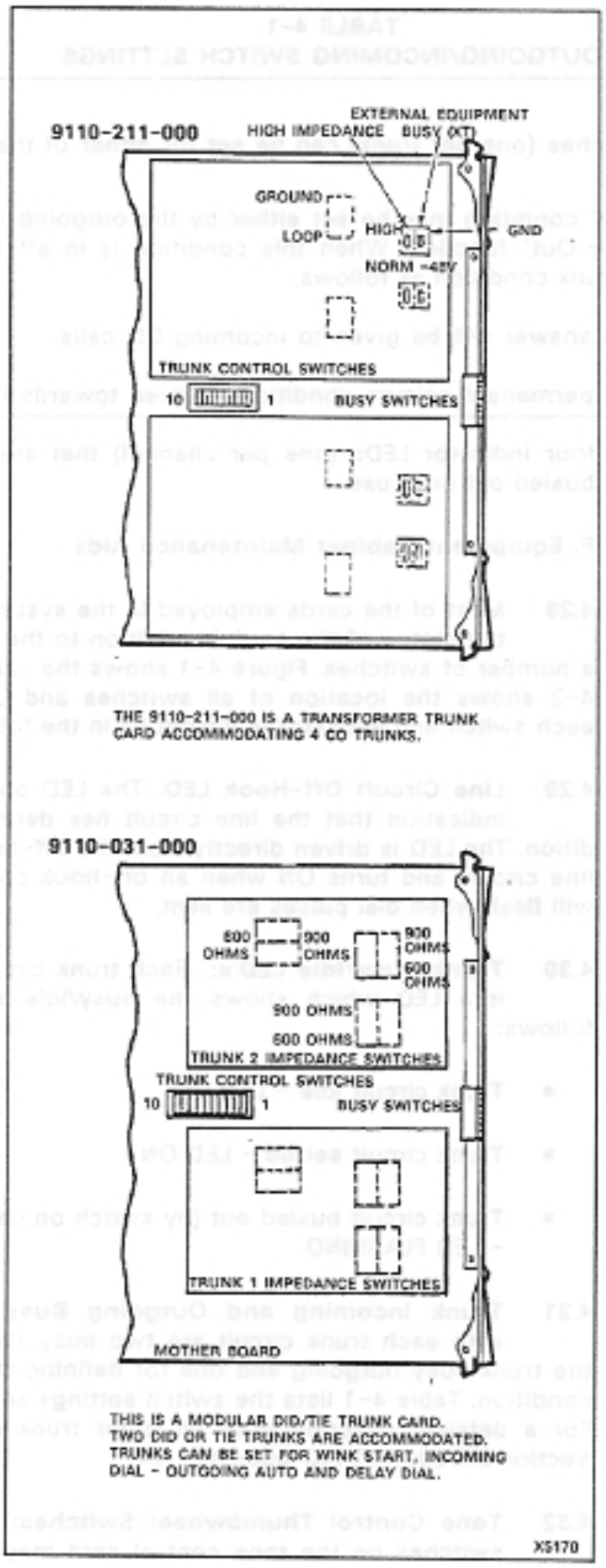


Figure 4-3 Trunk Cards (Cont'd)

TABLE 4-1
OUTGOING/INCOMING SWITCH SETTINGS R1

Trunk Busy Switches

1. Outgoing busy switches (one per trunk) can be set for either of the following conditions: Idle or Busy
2. The "Outgoing Busy" condition may be set either by the outgoing busy switch, or by the console "Trunk Busy Out" function. When this condition is in effect, the incoming busy switch affects the trunk condition as follows:

   Idle Setting - No answer will be given to incoming CO calls.

   Busy Setting - A permanent seizure condition is given towards the CO.

four indicator LEDs (one per channel) that are lit when a channel is busied out or in use.

F. Equipment Cabinet Maintenance Aids

4.28 Most of the cards employed in the system hold LED's to display the status of the card. In addition to the LED's some cards have a number of switches. Figure 4-1 shows the card positions, and Figure 4-2 shows the location of all switches and LED's. The functions of each switch and indicator is described in the following paragraphs.

4.29 **Line Circuit Off-Hook LED:** The LED on each line circuit is an indication that the line circuit has detected an off-hook condition. The LED is driven directly from the off-hook detect circuit in the line circuit, and turns ON when an off-hook condition is detected and will flash when dial pulses are sent.

4.30 **Trunk Busy/Idle LED's:** Each trunk circuit has associated with it a LED which shows the busy/idle status of the trunk as follows:

- Trunk circuit idle - LED OFF
- Trunk circuit seized - LED ON
- Trunk circuit busied out (by switch on card or from the console) - LED FLASHING.

4.31 **Trunk Incoming and Outgoing Busy Switches:** Associated with each trunk circuit are two busy switches, one for making the trunk busy outgoing and one for defining the incoming trunk busy condition. Table 4-1 lists the switch settings and describes their effect. For a detailed description of all other trunk card switches, refer to Section MITL9105/9110-090-200-NA.

4.32 **Tone Control Thumbwheel Switches:** The four thumbwheel switches on the tone control card may be used for both programming and maintenance functions. The number settings read from

top to bottom (see Table 4-3) and are used for Programming and Maintenance Functions.

(a) **Maintenance Functions:** The thumbwheel switches may be used in conjunction with the test line to select receivers and speech paths. The top two switches are used to select a receiver by setting the switches to the last digits of the required receiver equipment number (even numbers only, 90-20). If set to 99, any free receiver will be selected. The bottom two switches are used to select a speech path (01-31 for speech paths, or 32 for the Music on Hold speech path). If set to 99, any free speech path will be selected.

(b) **Programming Functions:** The console that may enter programming is defined.

(c) **The Customer Program Dump/Load Function:** Requires the switches to be set to a specific position to initiate a load from an external storage device (see 5.12).

4.23 **Scanner Digit Display:** The scanner card (position 19, shelf 1) contains a 2-digit display which is used to display faulty card positions, and may also be used in conjunction with the test line to display the status of selected circuits. The 2-digit display should always be read from top to bottom. The display will show the position number of the faulty card (01-22 for equipment shelf 1 and 31-42 for equipment shelf 2). When used in conjunction with the test line, the display shows the status of the receiver and/or the speech path which has been selected. The top display shows receiver status and the bottom display shows the speech path status. The displays used are shown in Table 4-2.

4.34 **Scanner (Master) Reset Button:** The Master Reset button is used in the initial programming process as part of the RAM clearing procedure and may also be used to reset the system. When the Master Reset button is pressed, the processor is momentarily turned off, all existing calls are dropped, and all system crosspoints are released.

4.35 **Scanner Baud Rate:** The baud rate switch selects the RS232 baud rate as either 300 or 1200 baud. The scanner card may also select parity, stop bit, and character length.

4.36 **IPC Diagnostic LED's:** The IPC card holds four diagnostic LED's:

- The top LED, when flashing, indicates that the automatic diagnostics are running.
- The second LED, when lit, indicates that the system is in the programming mode.
- The third LED, when lit, indicates that the RS232 port is in use.

- The fourth LED, when lit, indicates that a Data Dump is in progress.

4.37 **IPC Load Button:** This button is used to initiate a system load.

4.38 **RAM Battery LED:** The batteries are used for backup power for the customer data. These are connected to an LED which when lit indicates that the batteries are being charged.

4.39 **Console Control Line and Data LED's:** LINE 1 and LINE 2 LED's, when lit, indicate that the associated console is active; i.e. when the handset or headset is plugged in. The designations 1 and 2 refer to the two consoles handled by the board. The LED's labelled DATA 1 and DATA 2 flicker whenever data is transmitted from the corresponding console to the console control card. (Data is transmitted whenever a console button is pressed.) These LED's can therefore be used to check console button operation and to check voice pair continuity to the console(s).

G. Maintenance Panel

4.40 At the top of the equipment cabinet is the maintenance panel (Figure 4-4). This panel provides the service personnel with access to the system through the maintenance console connector and test line terminals. Also housed on the maintenance panel are the six Power Fail Transfer Control switches, a system Power ON/OFF switch and a Power ON LED.

TABLE 4-2
SCANNER DISPLAYS R1

Display	Meaning
A	Available – not in use.
C	Conversation – in use.
E	Error – found faulty by diagnostics.
F	Found – in use by test line.
O	Option – no specific circuit selected.

4.41 **Maintenance Console Connector:** This connector is provided to allow the installer/repair person to plug in a console for administration purposes (i.e. to program changes in system data).

TABLE 4-3
SWITCH SETTINGS R1

Switch Settings	Function
7770	Enter Maintenance Console into programming mode.
7771	Enter Supervisor Console 1 into programming mode.
7772	Enter Supervisor Console 2 into programming mode.
7776	Initialize System Configuration (clear RAM).
XXXn	Take any console out of programming mode (one of the X = any digit except 7, n = 0-9).
777n	Enables reset from test line or console (n = 0-9).
5623	Load Function (see also H. Customer Data Dump/Load).

4.42 **Power Fail Transfer Control Switches:** These switches are used to determine the source of a power fail transfer. Power fail transfer will occur whenever a Major Alarm occurs. A Major Alarm may be caused by a common control failure, a power supply failure, or by the operation of a failure transfer switch on one of the consoles. The power fail switches have two positions, ENABLE and DISABLE. When set to ENABLE, the system allows power fail transfer to be initiated from the designated source. When set to DISABLE, the designated source cannot initiate power fail transfer; e.g. with the COMMON CONTROL power fail transfer control switch set to ENABLE, a common control failure will cause a power fail transfer. The MASTER power fail transfer switch will set the System to power fail transfer when operated to the TRANSFER position. For regular operation, this switch should be set to NORMAL. The switches associated with a console must be set to disable when that console is not in use.

4.43 **Test Line Terminals:** The test line TIP and RING terminals may be used in conjunction with a test set (butt-in) and the thumbwheel switches on the tone control card, to access individual speech paths, receivers, and trunks for test purposes. The test line also has the capability of resetting system errors, busying out and debusying receivers and speech paths, and controlling the printer. See Part 5 for a full description of the use of the Test Line.

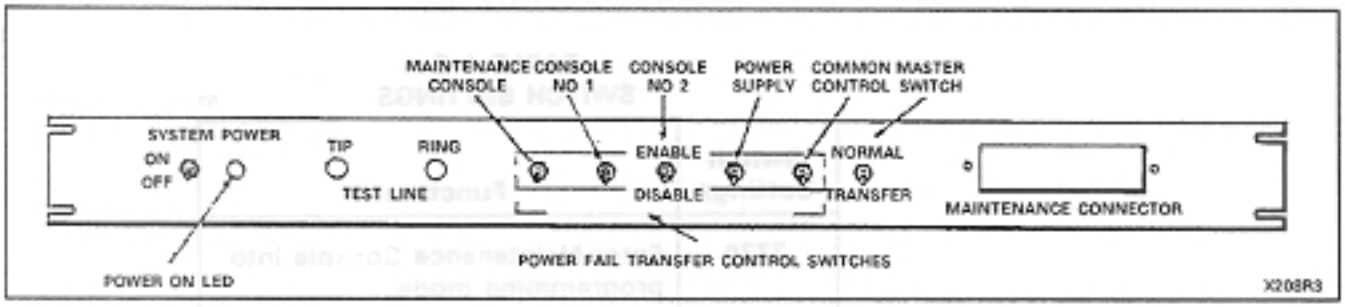


Figure 4-4 Maintenance Panel

H. Console Alarm LED's and Maintenance Aids

4.44 Each Supervisor console (Figure 4-5) is equipped with a number of maintenance aids and keys which are associated with maintenance functions. The following paragraphs describe the function of each LED and key.

4.45 **Minor (MIN) Alarm LED:** This LED will flash whenever the automatic diagnostics detect a malfunction which is not sufficiently serious to cause a complete system failure. Typical examples would include receiver malfunction, speech path malfunction and crosspoint malfunction.

4.46 **Console (CON) Alarm LED:** The Console Alarm LED flashes to indicate a console malfunction. The LED will go off when the alarm has been cleared or cancelled.

4.47 **Major (MAJ) Alarm LED:** This LED turns ON to indicate that a malfunction has occurred which has caused the power fail transfer relays to operate.

- When the MAJ Alarm LED is ON, the System is automatically in power fail transfer mode.
- Typical examples of major alarms include Scanner failure or CPU malfunction.
- The MAJ Alarm LED, unlike the other console LED's, is hard-wired from the System cabinet to the console.

4.48 **Alarm Reset:** This button is used to reset the flashing minor alarm LED and the audible signal associated with the minor alarm indication. When the key is pressed, it:

- Resets the flashing LED so that the LED remains on steady, and audible alarm signal associated with the alarm condition is turned off.
- Displays in the SOURCE and DESTINATION give the details of the alarm condition, including the location of the printed circuit card that has malfunctioned.

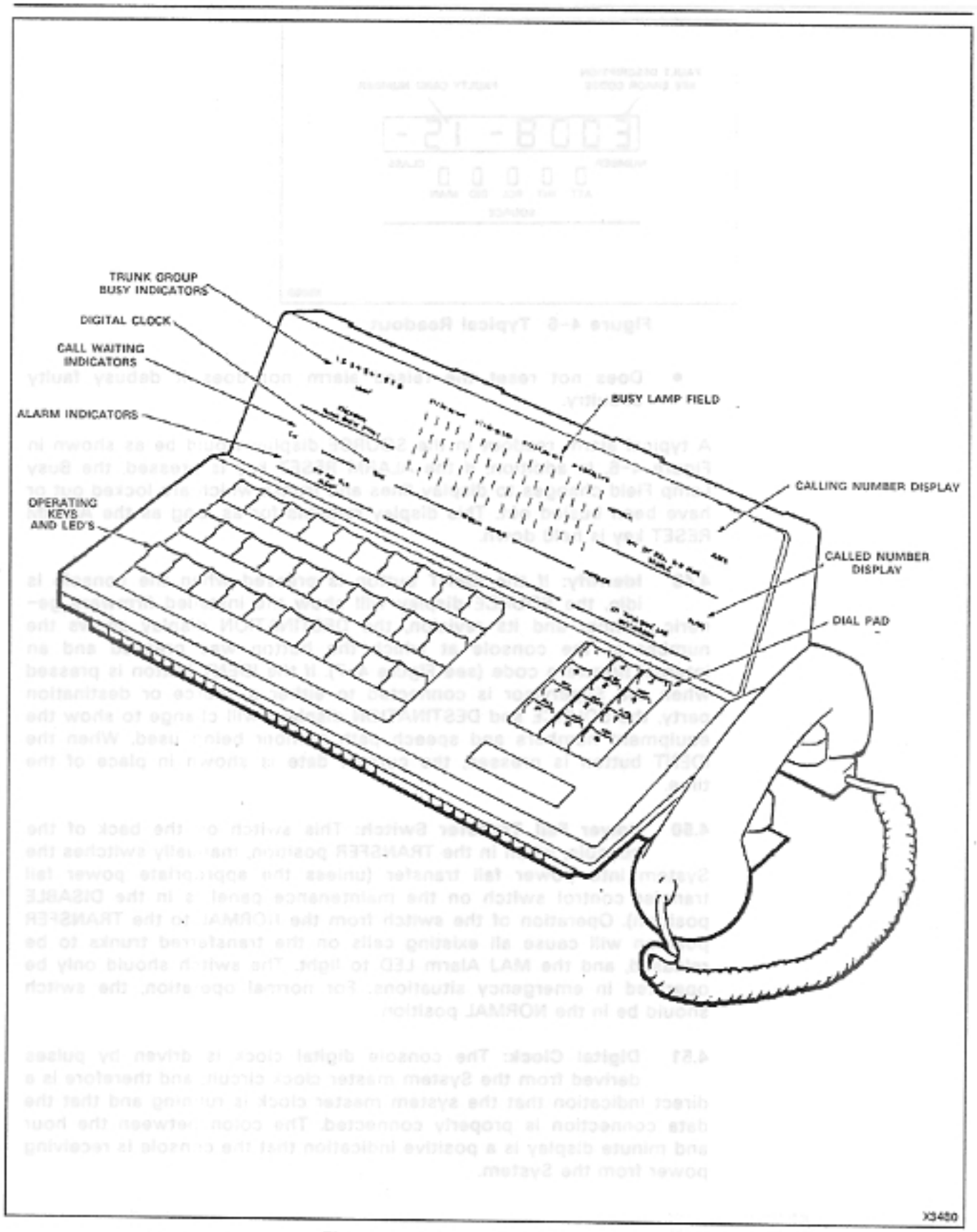


Figure 4-5 Supervisor Console

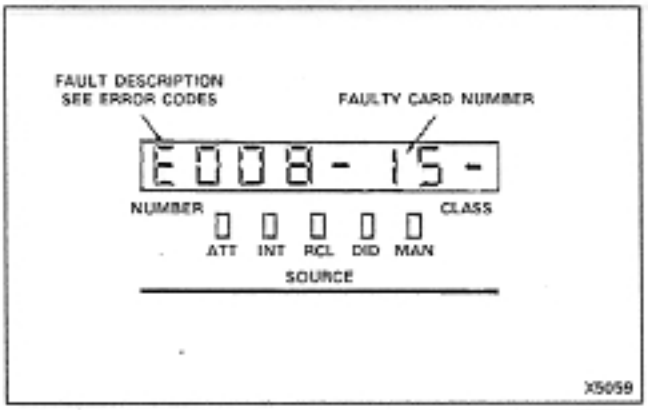


Figure 4-6 Typical Readout

- Does not reset the raised alarm nor does it debusy faulty circuitry.

A typical alarm readout in the SOURCE display would be as shown in Figure 4-6. In addition, if the ALARM RESET key is pressed, the Busy Lamp Field changes to display lines and trunks which are locked out or have been busied out. This display remains for as long as the ALARM RESET key is held down.

4.49 **Identify:** If the IDENT button is pressed when the console is idle, the SOURCE display will show the installed firmware generic number and its revision, the DESTINATION display shows the number of the console at which the button was pressed and an internal firmware code (see Figure 4-7). If the IDENT button is pressed when the Supervisor is connected to either a source or destination party, the SOURCE and DESTINATION displays will change to show the equipment numbers and speech path number being used. When the IDENT button is pressed, the current date is shown in place of the time.

4.50 **Power Fail Transfer Switch:** This switch on the back of the console, when in the TRANSFER position, manually switches the System into power fail transfer (unless the appropriate power fail transfer control switch on the maintenance panel is in the DISABLE position). Operation of the switch from the NORMAL to the TRANSFER position will cause all existing calls on the transferred trunks to be released, and the MAJ Alarm LED to light. The switch should only be operated in emergency situations. For normal operation, the switch should be in the NORMAL position.

4.51 **Digital Clock:** The console digital clock is driven by pulses derived from the System master clock circuit, and therefore is a direct indication that the system master clock is running and that the data connection is properly connected. The colon between the hour and minute display is a positive indication that the console is receiving power from the System.

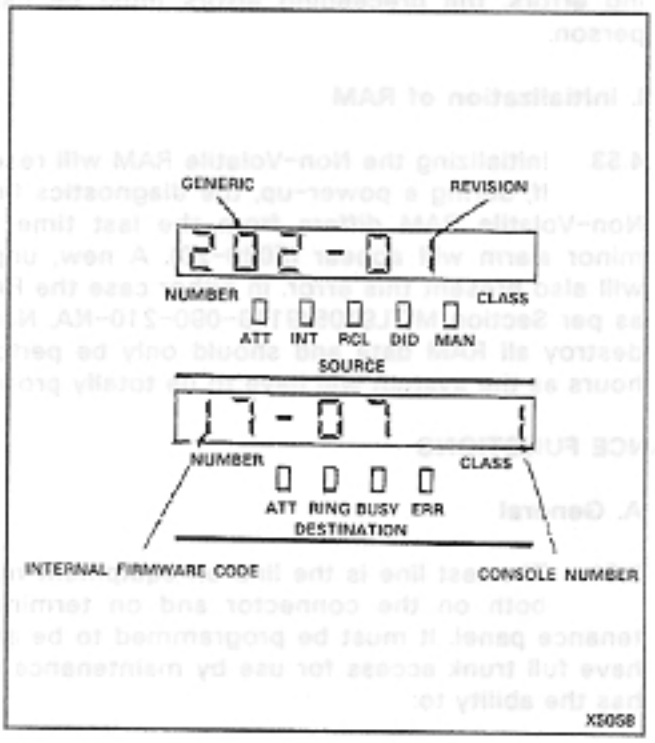


Figure 4-7 Typical Identification Display

4.52 Error Codes: The error codes (Table 4-4) displayed on the console indicate the card causing the malfunction and the type of malfunction. Figure 4-8 shows a typical error display and its interpretation. Figure 4-9 shows the equipment numbers and card positions. The alarm may be cancelled and removed from the console by dialing * 8 # (assuming the use of * as the Supervisor function), then pressing the RELEASE button. This will remove the alarm from the console but will not debusy the affected circuit. To display the remain-

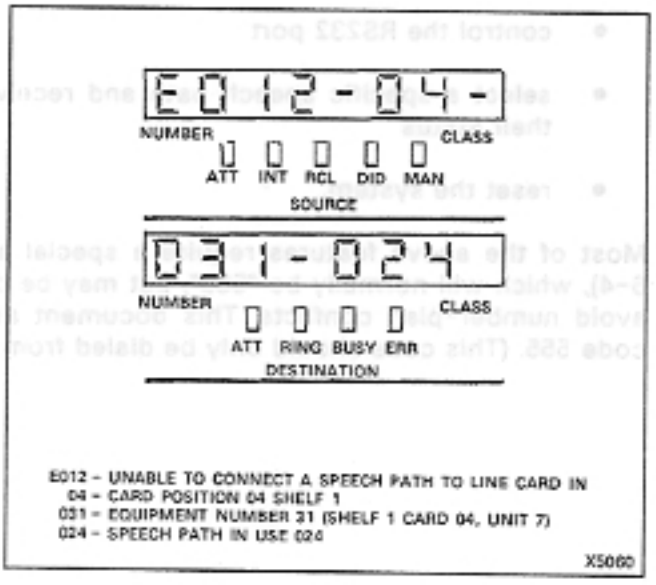


Figure 4-8 Typical Error Display

ing errors, the preceeding errors must be cancelled by the service person.

I. Initialization of RAM

4.53 Initializing the Non-Volatile RAM will reset the logic in the RAM. If, during a power-up, the diagnostics find the checksum in the Non-Volatile RAM differs from the last time it was programmed, a minor alarm will appear (E020-20). A new, unprogrammed RAM card will also present this error. In either case the RAM should be initialized as per Section MITL9105/9110-090-210-NA. Note that initialization will destroy all RAM data and should only be performed during nontraffic hours as the system will have to be totally programmed.

5. MAINTENANCE FUNCTIONS

A. General

5.01 The test line is the line on equipment number 001, and appears both on the connector and on terminal posts on the maintenance panel. It must be programmed to be an extension, and should have full trunk access for use by maintenance personnel. The test line has the ability to:

- directly access a trunk or an extension
- initiate a date dump
- set and clear the busy out conditions of speech paths and receivers
- initialize a card slot
- clear all errors
- control the RS232 port
- select a specific speech path and receiver for use and display their status
- reset the system.

Most of the above features require a special access code (see Table 6-4), which will normally be "555", but may be different if necessary to avoid number-plan conflicts. This document assumes the use of the code 555. (This code should only be dialed from one source at a time.)

HARDWARE POSITION NUMBER	PLUG 7						PLUG 9						PLUG 11										EXTENSION UNIT NO.	TRUNK UNIT NO. (4 TRUNK)	TRUNK UNIT NO. (2 TRUNK)
	161	169	177	185	193	201	209	217	225	233	241	249											1		
	162	170	178	186	194	202	210	218	226	234	242	250											2	1	1
	163	171	179	187	195	203	211	219	227	235	243	251											3		
	164	172	180	188	196	204	212	220	228	236	244	252											4	2	
	165	173	181	189	197	205	213	221	229	237	245	253											5		
	166	174	182	190	198	206	214	222	230	238	246	254											6	3	2
	167	175	183	191	199	207	215	223	231	239	247	255											7		
	168	176	184	192	200	208	216	224	232	240	248	256											8	4	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	CARD POSITION		
	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	SLOT NUMBER		
	PLUG 8						PLUG 10						PLUG 12												

SHELF 2 (SX-200 ONLY)

HARDWARE POSITION NUMBER	PLUG 1						PLUG 3						PLUG 5										EXTENSION UNIT NO.	TRUNK UNIT NO. (4 TRUNK)	TRUNK UNIT NO. (2 TRUNK)
	001	009	017	025	033	041	049	057	065	073	081	089	097	105	113	CONSOLE CONTROL/RCP CARD	CONSOLE CONTROL CARD	TONE CONTROL					1		
	002	010	018	026	034	042	050	058	066	074	082	090	098	106	114								2	1	1
	003	011	019	027	035	043	051	059	067	075	083	091	099	107	115				RESERVED				3		
	004	012	020	028	036	044	052	060	068	076	084	092	100	108	116				FOR				4	2	
	005	013	021	029	037	045	053	061	069	077	085	093	101	109	117				COMMON				5		
	006	014	022	030	038	046	054	062	070	078	086	094	102	110	118				CONTROLS				6	3	2
	007	015	023	031	039	047	055	063	071	079	087	095	103	111	119								7		
	008	016	024	032	040	048	056	064	072	080	088	096	104	112	120								8	4	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	CARD POSITION		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	SLOT NUMBER		
	PLUG 2						PLUG 4						PLUG 6												

SHELF 1

NOTES:
1. DUAL AND OR QUAD RECEIVER EQUIPMENT NUMBERS ARE 090, 098, 106, 114, 092, 100, 108 AND 116.
2. QUAD RECEIVER EQUIPMENT NUMBERS ARE 094, 102, 110, 118, 096, 104, 112 AND 120.
3. EQUIPMENT POSITION 001 IS RESERVED FOR THE TEST LINE AND MUST THEREFORE BE EQUIPPED WITH A LINE CARD.
4. TRUNK EQUIPMENT NUMBER IS SAME AS INDIVIDUAL TRUNK ACCESS CODE.
5. SLOT 15 IS RESERVED FOR RECEIVER NO. 1.
6. MAXIMUM NUMBER OF SUPERSET'S = 64.

T842

Figure 4-9 Hardware/Equipment Numbering

TABLE 4-4
ERROR CODES

R2

Code	Major Minor	Slot	Reason	First 3 Digits of Destination Display	Last 3 Digits of Destination Display	See Note
E001	major*/ minor	20	Error in RAM	Hi byte of address	Bits found in error	7.
E002	major*/ minor	20	PROM checksum error	0-17 slot 20 (PROM page number)	-	7.
E003	major	19	Clock/scanner error 1 = 1st interrupt missing 2 = 2nd interrupt missing 3 = Fail 1st interrupt test 4 = Fail 2nd interrupt test		-	
E004	minor	18	Speech path check circuit not "hi" when disconnected	-	-	1.
E005	minor	18	Bias circuit not connected to speech path	Speech path number	-	2.
E006	minor	99 (slot not known)	Speech path short	Speech path that has bias applied	Other speech path number on which bias was seen	2.
E007	minor	18	Dial tone circuit not connected to speech path	Speech path number		2.
E008	minor	Receiver Card	Receiver not receiving tone digits	Receiver equipment number	-	3.
E009	minor	Receiver Card	Receiver not receiving pulse digits	Receiver equipment number	-	3.
E010	minor	18	Generator error	Generator number (1 and 2 are tone, 3 and 4 are pulse)	-	4.
E011	minor	Receiver Card	Generator/Receiver error isolated to a speech path NOTE - error could be on receiver card or on tone control card (slot 18)	Speech path number	-	2.

TABLE 4-4 (CONT'D)
ERROR CODES

Code	Major Minor	Slot	Reason	First 3 Digits of Destination Display	Last 3 Digits of Destination Display	See Note
E012	minor	Line or Trunk Card	Unable to connect the speech path to the line programmed as a "station" or "trunk"	Equipment number	Speech path number	5.
E013	minor	18	Supervisory tone missing		–	6.
E014	minor	Receiver Card	Receiver dial-tone detector not working	Receiver equipment number	–	3.
E015	minor	Receiver Card	Probable receiver error	–	–	4.
E018	minor	99 (slot not known)	Speech path shorted out	Speech path number	–	2.
E019	minor	18	16 speech paths have been found in error, probably a fault in the checking circuit	–	–	1.
E020	minor	16 or 17	Excessive errors in console data circuits	Console number 0 – maintenance console 1 and 2 – Supervisor consoles	–	
E021	minor	20	Non-Volatile RAM checksum error	–	–	8.
E023	major	20	NVR Battery Backup problem 001 = no battery jumper present 002 = voltage out of tolerance			
E030	minor	Slot Number Displayed	Trunk failure 001 = no seize acknowledge 002 = no release acknowledge			

TABLE 4-4 (CONT'D)
ERROR CODES

Code	Major Minor	Slot	Reason	First 3 Digits of Destination Display	Last 3 Digits of Destination Display	See Note
E088	minor	-	Auto Wakeup not answered	Extension Number		
E096	minor	Slot Number Displayed	SUPERSET disconnected	SUPERSET Number		
E098	minor	-	Printer port disabled			
E099	minor	-	Extension locked out	EXT #	LO	

* During Power-up sequence only.

Notes

1. No more tests using the check circuit will be performed.
2. The speech path shown in the first two digits of DESTINATION display is busied out, a maximum of 16 speech paths may be busied out.
3. The receiver is busied out, maximum one receiver on a Dual Receiver card and two receivers on a Quad Receiver card.
4. The generator is busied out, maximum one. No further generator tests are performed.
5. No further tests on this slot are performed. This error will occur if a card is not installed for a programmed line.
6. No further tests for supervisory tone presence are performed.
7. No further tests are performed.
8. E021 will be lost if the system is reset or the power is turned off.

5.02 Any console in the system can perform the same functions using the Maintenance Function code with the exception of accessing a specific speech path and receiver. Some maintenance functions can only be performed from a console (Table 6-4).

Note: The rotary switches on the tone control card (slot 18) should usually be set so that the top switch is NOT 9, 0, 1 or 2. See 5.06 "Select a Speech Path" for the use of these switches.

B. Direct Station Trunk Access

5.03 The test line or console dials 555 + 2 + nnn, where "nnn" is the 3-digit equipment number including leading zeros. Reorder tone indicates that the equipment number is not that of an extension or trunk. Busy tone indicates that the equipment is not idle, otherwise the line is connected. If the trunk is a member of a group programmed "wait for dial tone", the connection is not made until dial tone is received.

C. Set and Clear Busy-Out of Receivers and Speech Paths

5.04 The test line or console dials 555 + 3 + nnn (set) or 555 + 4 + nnn (clear), where "nnn" is either the 3-digit equipment number of a receiver, or is 3 + the 2-digit speech path number (i.e. 301-331). Reorder tone indicates that the number is invalid, and dial tone indicates that the operation is completed.

D. Clear All Errors

5.05 The test line or console goes off-hook and dials 555 + 1. Dial tone is returned. All outstanding minor alarms are cleared. All busied out receivers, generators, and speech paths are set back to normal, and the self-test function is restarted.

E. Select a Speech Path

5.06 This procedure is used to select a speech path and/or a receiver when the test line goes off-hook, and can be used to display the status of a speech path or receiver. This function is only active when the top switch on the tone card is set to 9, 0, 1, or 2 and may only be done from the test.

5.07 The top two switches on the tone control card select the receiver to be used. The switches should be set to the last two digits as the low two digits of the receiver equipment number (even numbers, 90-20). If set to 99, any free receiver is used (see Figure 5-1). The bottom two switches select a speech path to be used, set up as the speech path number (01-31), or the Music on Hold speech path may be selected as 32 (in which case no receiver will be connected). If set to 99, any free speech path is used.

5.08 After setting the switches, when the test line goes off-hook, it waits for the selected speech path to become free and seizes it. It then waits for the selected receiver to become free. A busied out speech path or receiver may be selected; the speech path may be used normally but the receiver will not respond to dialing. If an illegal number is set up, no device will be selected. The two 7-segment displays on the scanner card show the status of the receiver and/or speech path when a specific one has been selected. The top display is for the receiver and the bottom display for the speech path. The readouts are:

- A - Available - not in use
- C - Conversation - in use
- E - Error - found faulty by diagnostics
- F - Found - in use by test line
- O - Optional - no specific circuit selected

5.09 Once the test line has obtained a speech path and a receiver, it does not change its selection until it originates a new call. Changing the switch settings meanwhile will cause the display to change to reflect the status of the receiver and speech path whose numbers are on the switches. If a valid speech path is selected, but an

invalid receiver is selected (e.g. 91), then the line is connected to the speech path, no receiver is selected, and no dial tone is introduced. This provides the ability to listen to a speech path for the presence of noise. The test line, since it has not been assigned a receiver, will not time out and revert to reorder tone. It is possible to listen to any unused speech path by remaining off-hook and selecting the speech path number with the bottom two switches.

F. Slot Initialization

5.10 Occasionally, when circuit cards are plugged into a shelf, the logic circuits on the card may not reset completely. In order to guarantee complete reset of all card logic, a slot initialization procedure must be performed. This procedure allows the service personnel to insert a card into a shelf and initialize the card slot. To initialize the card slot, dial 555 + 5 + nn from the test line or the console, where nn is the card slot number (1-17 shelf 1, 31-42 shelf 2). Since inserting a card may cause diagnostic errors, this procedure is normally followed by dialing 555 + 1 to clear all system errors.

G. System Reset

5.11 The test line or console may reset the system by dialing 555 + 6.

H. Customer Data Dump/Load

5.12 The customer data dump-load feature allows the programmer to dump all the customer data to a recording device, and or load all or specific blocks of customer data. Refer to Table 5-1 for the type of data that each block contains.

5.13 Block numbers 5, 6, 7 and 8 will contain whatever information was in those fields when the copy of the data was made. In other words, the contents of all, room status, abbreviated dialing etc., will be entered into the system as they were at the time the tape was made. For example, if an extension had a room status of 4 and the system was reloaded with the room status of 2 on the recording device, the extension's room status would become 2.

Dump the System

5.14 To "dump" the entire contents of the Customer Data to a recording device:

(1) If a tape is used, ensure that it is of the correct length as outlined in the Conditions part of this page, and start the tape at the beginning.

(2) Disconnect the device currently connected to the system RS232 port and connect the recording device to the RS232 port. Place the recording device in the recording mode.

(3) Dial 555 + 71.

HARDWARE POSITION NUMBER	DUAL RECEIVER	QUAD RECEIVER
089 097 105 113		
090 098 106 114	----	----
091 099 107 115		
092 100 108 116	----	----
093 101 109 117		
094 102 110 118		----
095 103 111 119		
096 104 112 120		----
12 13 14 15	Card Position	

Figure 5-1 Receiver Equipment Numbers

(4) Dial the appropriate data block number (from the Table 2-1), each block separated by an * and using another * to signify the end of the entry, or dial * to dump all the RAM data.

(5) Dial * 14 #.

(6) Press the ENTER button on the console to start the dump. For the duration of the dump, LED 3 on the IPC will be glowing.

(7) When the dump is over, as indicated by LED 3 on the IPC extinguishing stop the output at the port by dialing *14 * at the console device to port. Restart the port by dialing * 14 # from the console and pressing the ENTER button.

TABLE 5-1
CUSTOMER DATA BLOCKS R1

Data Block Number	Customer Data Block Information
1	All Standard Programming and Special Set Customer Data
3	ARS
4	Discriminatory Barring
5	Station Information (extension meters, rooms status)
6	Alarm Call
7	System Abbreviated Dialing
8	Special Set Abbreviated Dialing

Loading

5.15 When loading the customer data, Customer Data Block 1 must be present or be loaded first. To load Customer Data Block 1:

(1) Set the thumbwheel switches on the Tone Control card to 4648.

(2) Disconnect the device currently connected to the RS232 port.

(3) Connect the recording device to the RS232 port.

(4) Set the recording device to read.

(5) Press the autoload button on the IPC. When the autoload button is pressed the system will reset, all calls will be lost and the system will be in automatic transfer for the duration of the dump. During the loading process the LEDs on the Scanner will read 01 to RR, where RR is the final block to be loaded (note that RR can not be calculated as it is a reflection of RAM data to be loaded).

(6) When the system has been loaded, LED 3 on the IPC will extinguish and the system will reset. Disconnect the recording device and reconnect the former device. At this time other Data Blocks may be entered or normal switch activity started.

All Customer Block Data Load

5.16 To load all Customer Data Blocks, Customer Data Block 1 must be entered first or be present. To load all Data blocks:

(1) When loading the system, Data Block 1 (Table 5-1) must be present or be loaded first.

(2) Set the thumbwheel switches on the Tone Control card to 5623.

(3) Disconnect the device currently connected to the RS232 port.

(4) Connect the recording device to the RS232 port.

(5) Set the recording device to read.

(6) Press the autoload button on the IPC. When the autoload button is pressed the system will reset, all calls will be load and the system will be in automatic transfer for the duration of the dump. During the loading process the LEDs on the Scanner will read 01 to RR, where RR is the final block to be loaded (note that RR cannot be calculated as it is a reflection of RAM data to be loaded).

(7) When the system has been loaded, LED 3 on the IPC will extinguish and the system will reset. Disconnect the recording device and reconnect the former device. At this time normal switch activity will start.

Loading Specific Data Blocks

5.17 To load a specific set of data blocks or a specific data block:

(1) When loading the system, Data Block 1 (Table 5-1) must be present or loaded first.

(2) To load a specific Data Block, set the thumbwheel switches on the Tone Control card to 3282.

(3) Disconnect the device currently connected to the RS232 port.

(4) Connect the recording device to the RS232 port.

(5) Set the recording device to read.

(6) From the console dial 555 + 72 + the first Data Block number (Table 2-1). If other Data blocks are to be loaded, dial * plus the next Data Block number followed by * for each Data Block. Use a double * to signify the last Data Block entry (i.e. 555 + 72 + 2 + * + 3 + **, would load data blocks 2 and 3).

(7) Press the ENTER button on the console and the system will reset, all calls will be lost and the system will be in automatic transfer for the duration of the dump. During the loading process the LEDs on the Scanner will read 01 to RR, where RR is the final block to be loaded (note that RR cannot be calculated as it is a reflection of RAM data to be loaded).

(8) When the system has been loaded, LED 3 on the IPC will extinguish and the system will reset. Disconnect the recording device and reconnect the former device. At this time other Data Blocks may be entered or normal switch activity started.

Errors

5.18 During a Dump/Load, an error may occur and be displayed on the console Source and/or Destination display. Consult Table 5-2 as to the type of error and its identification.

I. Data Port Control

5.19 To enable the data port, dial + 14 #, press RELEASE from the console, or 555 + 8 # or 555 + 82 from the test line. To disable the data port (and to stop all system activities that require a printout), dial ⁎ 14 ⁎ , press RELEASE from the console, or 555 + 8 or 555 + 81 from the test line. To ignore or purge any printing, dial ⁎ 1400, press RELEASE from the console or 555 + 800 from the test line.

TABLE 5-2
SCANNER DUMP/LOAD DISPLAYS R1

Display	Meaning
FL	Load Finished.
A#	Number of records written inconsistent with the number on the tape.
B#	Checksum line does not verify.
C#	Checksum error. If the display is CO, the error is a label record error. If the error is a C + a number, it is Data Block error.
D#	Data Block found but not on label.
E0	Data Block Number requested not on tape.
F0	Load attempted - no Data Block numbers entered.

J. Forced Trunk Release

5.20 This feature allows service personnel to force a busy trunk into the idle state. At the console, dial ⁎ 20nnn ## (⁎ is the Supervisor function code), where nnn is the individual trunk equipment number; press the RELEASE button. Care should be taken when force releasing a trunk. The trunk will be forced into the idle state even if the trunk is legitimately in use.

K. Current Speech Path Display

5.21 This procedure is used to display the speech path number being used by a source or destination party. If the console has a destination party, pressing the console IDENT button causes the number of the speech path in use to be displayed in segments 7 and 8 of the DESTINATION display. Similarly, if the console has a source party, pressing the IDENT button causes the speech path number to be displayed in segments 7 and 8 of the SOURCE display.

L. Line and Trunk Status Display

5.22 This function allows the Supervisor to display certain information regarding the status of a selected line or trunk. This feature aids MITEL Field Engineers to diagnose malfunctions from a remote location. To display the line or trunk status, dial * # nnn # from the console or test line, where nnn is the equipment number of the line or trunk. Care should be taken when recording the status display. The record must include any blanks, dashes, or symbols exactly as shown in the Source and Destination displays. For further information, see Section MITL9105/9110- 090-350-NA, SX-100 and SX-200 Troubleshooting.

M. Cancelling a Minor Alarm

5.23 A minor alarm may be cancelled and removed from the console by dialing * 8 #, and pressing the RELEASE button (where * is the Supervisor Function code). This allows alarms to be recalled sequentially from a queue (maximum 16), but does not debusy any of the circuits.

N. Setting the System Identifier

5.24 The system identification number for use in Traffic reports may be set by dialing * 17 nnn, and pressing the RELEASE button (where nnn is the 1- to 3-digit system number).

6. SYSTEM PARAMETERS

General

6.01 System parameters are included in the following tables:

- Table 6-1, System Feature Limitations
- Table 6-2, Time-Out Information
- Table 6-3, Supervisor Function Access Codes
- Table 6-4, Maintenance Function Access Codes.
- Table 6-5,Lists All Supervisor Function Codes.

TABLE 6-1
SYSTEM FEATURE LIMITATIONS

R2

Maximum number of simultaneous calls = 31.

Maximum number of speech paths used by any call = 2.

Maximum number of simultaneous consultations = 15.

Maximum number of simultaneous add-on (3-way) calls = 30.

Maximum number of simultaneous station-controlled conference calls = 30.

Maximum number of calls that can simultaneously be camped on to an extension, trunk group or hunt group = 30.

Maximum number of simultaneous callbacks that can be enabled = 32.

Maximum number of simultaneous call forwards that can be enabled = 208(SX-200); 112(SX-100).

Maximum number of simultaneous "dial 0" calls = 31.

Maximum number of hunting groups = 12.

Maximum number of calls that can be simultaneously connected to Music on Hold = 31.

Maximum number of stations in a station hunting group = 200(SX-200); 112(SX-100).

Maximum number of stations in a call pickup group = 200(SX-200); 112(SX-100).

Maximum number of dial call pickup groups = 30.

Maximum number of trunks assignable to night stations = 100(SX-200); 52(SX-100).

Maximum number of trunks in a trunk group = 104(SX-200); 56(SX-100).

Maximum number of trunk groups = 12.

Maximum number of calls that can override a given extension = 1.

Maximum number of calls that can be simultaneously parked = 31.

Maximum number of simultaneous meet-me conferences = 1.

Maximum number of simultaneous Supervisor-controlled conferences = 1 (2 if tenanting with separate consoles).

Maximum number of calls that can be simultaneously held by one Supervisor = 4.

Maximum number of simultaneous incoming calls that can be separately identified by the Supervisor = 6 (Recall, Dial 0, LDN 1 through LDN 4).

Maximum number of LDN's that can be identified at the Supervisor's console = 4.

Maximum number of simultaneously ringing wake-ups = 10.

Number of personal speed call tables = 25.

Maximum number of common-use speed call tables = 18.

System numbering schemes may be 1-, 2-, 3- or 4-digit or a combination of 1-, 2-, 3- and 4-digit, as long as there are no conflicts in the first digits.

Maximum number of trunk buffers for SMDR = 45.

Maximum number of speed call digits that may be stored = 56 (per table).

Maximum number of SUPERSETs = 64.

TABLE 6-2
SYSTEM TIME-OUT INFORMATION

R1

Description	Time-Out
Supervisor-Timed Recall (Don't Answer)	10 s, 20 s, 30 s, or 40 s
Supervisor-Timed Recall (Camp-On)	20 s, 30 s, or 40 s
Supervisor-Timed Recall (Hold)	20 s, 30 s, or 40 s
Automatic Night Switching	20 s, 30 s, or 40 s
Dial Tone Time-Out	15 s
Interdigit Time-Out (Extensions)	15 s
Interdigit Time-Out (Trunks)	10 s
Lockout Time-Out	45 s
Callback Clear Time-Out	8 hours
Callback Don't Answer Reset	6 rings
Call Park Recall	2, 3 or 4 minutes
Call Hold Recall	2, 3 or 4 minutes
Call Forwarding - Don't Answer Time-Out	10 s, 20 s, 30 s, or 40 s
Switchhook Flash	Min. 200 ms Max. 0.7 s, 0.9 s, 1.1 s or 1.5 s
Ringing Time-Out	5 minutes (programmable 1 minute)
Ringing Time-Out (System Option 265 Enabled)	1 minute
Automatic Wake-Up Ringing	6 rings, 3 s each
Automatic Wake-Up Attempts	3 at 5 minute intervals

TABLE 6-3
SUPERVISOR FUNCTION ACCESS CODES

R3

These codes assume the use of * as the Supervisor Function code (Feature Number 18). For Supervisor Function codes used in Traffic Measurement see Section MITL9105/9110-096-450-NA.

To cancel all call forwarding:

a) Dial *1, or *11
b) Dial #
c) Press RELEASE button

To access an individual trunk:

a) Dial *20
b) Dial individual trunk access number (equipment number)
c) Dial *
d) Press RELEASE button

To force-release an individual trunk:

a) Dial *20
b) Dial individual trunk access number (equipment number)
c) Dial # #
d) Press RELEASE button

To make flexible night service assignments (Note 3):

a) Dial *3
b) Dial individual trunk access number (equipment number)
c) Press NIGHT 1 or NIGHT 2
d) Dial extension number
e) Press RELEASE button

To cancel all system callbacks:

a) Dial *4
b) Dial #
c) Press RELEASE button

To set the clock time:

a) Dial *5
b) Dial time (2-digit hour plus 2-digit minutes plus 2-digit year)
c) Dial * for p.m., otherwise a.m.
d) Press RELEASE button

To make trunk group Supervisor access only:

a) Dial *6
b) Dial trunk group (1 through 10)
c) Dial *
d) Press RELEASE button

To make trunk group extension and Supervisor access:

a) Dial *6
b) Dial trunk group (1 through 10)
c) Dial #
d) Press RELEASE button

To change the Direct Inward System Access Code:

a) Dial *7
b) Dial DISA code
c) Press RELEASE button

To cancel a minor alarm (Note 1):

a) Dial *8
b) Dial #
c) Press RELEASE button

To busy out an individual trunk (Note 3):

a) Dial *9
b) Dial individual access number (equipment number)
c) Dial *
d) Press RELEASE button

To de-busy an individual trunk (Note 3):

a) Dial *9
b) Dial individual trunk access number (equipment number)
c) Dial #
d) Press RELEASE button

To change the status of all occupied clean rooms to occupied and needs cleaning:

a) Dial *10
b) Dial *
c) Press RELEASE button

To change the status of all occupied rooms in the need of cleaning to occupied clean:

a) Dial *10
b) Dial #
c) Press RELEASE button

TABLE 6-3 (CONT'D)
SUPERVISOR FUNCTION ACCESS CODES

To set up call forwarding:

a) Dial ⁎11nnn, where nnn is the extension number of the forwarding extension
b) Dial call forwarding code (1-4)
c) Dial mmm, where mmm is the number to which the calls are to be forwarded
d) Press RELEASE button

To cancel call forwarding for an extension:

a) Dial ⁎11nnn, where nnn is the extension number of the forwarding extension
b) Dial #
c) Press RELEASE button

To display call forwarding set for an extension:

a) Dial ⁎11nnn, where nnn is the extension number of the forwarding extension
b) Press RELEASE button

To cancel all call forwarding:

a) Dial ⁎1# or ⁎11#
b) Press RELEASE button

To busy out an extension (Note 3):

a) Dial ⁎12nnn, where nnn is the number of the extension to be busied out
b) Dial ⁎
c) Press RELEASE button

To de-busy an extension (Note 3):

a) Dial ⁎12nnn, where nnn is the number of the extension to be de-busied
b) Dial #
c) Press RELEASE button

To suspend the printer (Note 3):

a) Dial ⁎14⁎
b) Press RELEASE button

To purge and ignore the printer (Note 3):

a) Dial ⁎14 00
b) Press RELEASE button

To enable the printer (Note 3):

a) Dial ⁎14 #
b) Press RELEASE button

To change the date:

a) Dial ⁎15 and 3- or 4-digit date (1- or 2-digit month, 2-digit day)
b) Press RELEASE button

To print the room register audit (Notes 2 & 3):

a) Dial ⁎16
b) Press RELEASE button

To change the system identity (Note 3):

a) Dial ⁎17nnn (1- to 3-digit ID, 0-999)
b) Press RELEASE button

To display current system identity:

a) Dial ⁎17
b) Press RELEASE button

To print the "room status" audit (Note 2):

a) Dial ⁎18
b) Press RELEASE button

To print stored customer data (Note 4):

a) Dial ⁎19 + n, where n is:
   - 0 A complete print (Note 5)
   - 1 System Options, Feature Acess Codes, Classes of Service, Hunt Groups and Extensions
   - 2 Trunk and Trunk Group Data
   - 3 Special Set Data
   - 4 Toll Control Data
   - 5 Speed Call Data
   - 6 Automatic Route Selection Data
   - ⁎ System-Wide Data (Note 6)
b) Press RELEASE button

TABLE 6-3 (CONT'D)
SUPERVISOR FUNCTION ACCESS CODES

Notes

1. The errors will be sequentially stacked in the memory and may be recalled sequentially (most recent first) by repeating the above procedure.
2. Printer starts after RELEASE button is pressed.
3. Requires system option programming.
4. The customer must have programming access to the features in order to request a printout.
5. This prints all sections provided the customer has programming access to the features.
6. This will print only the system-wide speed call tables and the system special set messages.

TABLE 6-4
MAINTENANCE FUNCTION ACCESS CODES

R3

To select any of the functions, the access code assigned for the maintenance function must be dialed (Feature Number 19). The code 555 is used in the following part for the maintenance code. This may be dialed from the test line or console.

Clear all errors:

a) Dial 555 + 1

Direct trunk or station access:

a) Dial 555 + 20
b) Dial individual equipment number (3-digit equipment number for trunk or station)

Busy out of a receiver

a) Dial 555 + 3
b) Dial equipment number of receiver

Busy out of a speech path:

a) Dial 555 + 33
b) Dial speech path number (01-31)

De-busy a receiver

a) Dial 555 + 4
b) Dial equipment number of receiver

De-busy a speech path:

a) Dial 555 + 43
b) Dial speech path number (01-31)

Initialize card slot:

a) Dial 555 + 5
b) Dial card slot number (01-17, 31-42)

System reset (Notes 2 and 3):

a) Dial 555 + 6

To initiate system dump (from test line):

a) Dial 555 + 7 and hang up
b) Go off-hook
c) Dial 555 + 8 + # (or 2)

To initiate system dump (from console)

a) Dial 555 + 7
b) Dial ⁎14#
c) Press RELEASE button

To suspend printer (Note 3):

a) Dial 555 + 8 + ⁎ (or 1), or
b) Dial ⁎14⁎ console only

To enable printer (Note 3):

a) Dial 555 + 8 + ⁎ (or 2), test line
b) Dial ⁎14# console only
c) Press RELEASE button

To purge and ignore printer (Note 3):

a) Dial 555 + 8 + 00, test line
b) Dial ⁎1400 console only
c) Press RELEASE button

To print stored Customer Data:

a) Dial 555 + 9 + n, where n is:
   - 0 A complete print (Note 4)
   - 1 System Options, Feature Access Codes, Classes of Service, Hunt Groups and Extensions
   - 2 Trunk and Trunk Group Data
   - 3 Special Set Data
   - 4 Toll Control Data
   - 5 Speed Call Data
   - 6 Automatic Route Selection Data
   - ⁎ System-Wide Data (Note 5)
b) Press RELEASE button

Note:

1. For Traffic Measurement Access Codes see MITL9105/9110-090-450-NA.
2. The thumbwheel switches on the Tone Control card should be set to XXYX, where X = any digit 0 - 9 and Y cannot be the digit 7.
3. Requires System Option Programming.
4. This prints all sections.
5. This will print only the system-wide speed call tables and and the system special set messages.