

**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
GENERAL DESCRIPTION**

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CONTENTS	PAGE
<b>1. INTRODUCTION</b> .....	1-1
General .....	1-1
Reason for Reissue .....	1-1
Section Overview .....	1-1
System Configurations .....	1-1
Peripheral Devices .....	1-1
Customer Data Entry (CDE) .....	1-2
<b>2. PHYSICAL DESCRIPTION</b> .....	2-1
General .....	2-1
Attendant Console .....	2-1
Control Cabinet .....	2-2
Universal Cabinet .....	2-2
Peripheral Cabinet .....	2-2
Power Supplies .....	2-7
<b>3. SYSTEM REQUIREMENTS</b> .....	3-1
<b>4. HARDWARE OVERVIEW</b> .....	4-1
General .....	4-1
Main Control Card .....	4-1
Floppy Disk Unit .....	4-1
Message Subsystem .....	4-1
Digital Signal Processor (DSP) .....	4-4
DX Module .....	4-4
Bay Control Card .....	4-5
Peripheral Control Card .....	4-5
Digital Interface Card .....	4-5
Scanner Card .....	4-5
Peripheral Cards .....	4-5
<b>5. SOFTWARE OVERVIEW</b> .....	5-1
General .....	5-1
Physical Layer .....	5-1
Scheduling Layer .....	5-1
Communications Layer .....	5-1
Device Input/Output Layer .....	5-1
Utilities Layer .....	5-1
Applications Layer .....	5-1
Main Control Processor Software .....	5-1
Peripheral Control Processor Software .....	5-2
Database .....	5-2
<b>6. CONFIGURATIONS</b> .....	6-1
General .....	6-1
<b>7. SX-200<sup>®</sup> DIGITAL PABX FEATURES</b> .....	7-1
<b>8. MAINTENANCE</b> .....	8-1
General .....	8-1
Maintenance Objectives .....	8-1

CONTENTS (CONT'D)

PAGE

RS-232 Terminal .....	8-1
Diagnostic Log Files .....	8-1
Types of Diagnostics .....	8-1

LIST OF TABLES

TABLE	TITLE	PAGE
3-1	SX-200® Environmental Requirements .....	3-1
3-2	SX-200® Electrical Requirements .....	3-1

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE
2-1	SX-200® Attendant Console .....	2-1
2-2	SX-200® DIGITAL PABX Control Cabinet .....	2-3
2-3	SX-200® DIGITAL PABX Universal Control Cabinet ...	2-4
2-4	SX-200® DIGITAL PABX Universal Control Cabinet with Digital Peripheral Shelf .....	2-5
2-5	SX-200® DIGITAL PABX Peripheral Cabinet .....	2-6
4-1	SX-200® DIGITAL PABX 480-Port Configuration Block Diagram .....	4-2
4-2	SX-200® DIGITAL PABX 336-Port Configuration Block Diagram .....	4-3
6-1	SX-200® DIGITAL 480-Port Configuration .....	6-4
6-2	SX-200® DIGITAL PABX 336-Port Configuration .....	6-5

## 1. INTRODUCTION

### General

1.01 This Section contains an overall description of the SX-200<sup>®</sup> DIGITAL PABX using Generic 1000 or Generic 1001 software.

### Reason for Reissue

1.02 This Section is reissued to provide a general description of the SX-200<sup>®</sup> DIGITAL PABX, with Generic 1000 or Generic 1001 software, in either a 336-port or a 480-port configuration.

### Section Overview

1.03 This Section is divided into seven parts as described below:

- Physical Description: The appearance and dimensions of the PABX are given.
- System Requirements: This part gives the environmental and electrical requirements for system operation.
- Hardware Overview: An overall description of system hardware is given.
- Software Overview: This part briefly describes the basic software layers required for system operation.
- System Configurations: A general listing of the different types of system configurations available is given.
- Features: A list of the PABX features provided in Generic 1000 and Generic 1001 is included.
- Maintenance: This part lists the automatic maintenance routines of the system.

### System Configurations

1.04 Two SX-200<sup>®</sup> DIGITAL PABX configurations are available: 336 ports in a single cabinet (fully digital), and 480 ports in two cabinets. Generic 1001 software supports the 336-port configuration, while both Generic 1000 and Generic 1001 software support the 480-port configuration.

### Peripheral Devices

1.05 The SX-200<sup>®</sup> DIGITAL PABX can interface to analog and digital peripheral devices using standard twisted-pair office wiring. The peripheral devices include, but are not limited to, the following:

- Rotary and DTMF Telephone Sets (Analog)



## General Description

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- Trunks (Analog)
- Electronic Telephone Sets (Refer to Section MITL9108-093-106-NA, SUPERSET 3™ Set and to Section MITL9108-093-107-NA, SUPERSET 4™ Set.)
- SX-200® LCD Attendant Console (Refer to Section MITL9108-093-315-NA, Attendant Console.)

### Customer Data Entry (CDE)

**1.06** Customer Data Entry is accomplished from the Maintenance Terminal, or alternatively, from the Attendant Console. The console LCD guides the attendant through the data entry procedure by displaying a series of prompts and listing the required steps to be performed. The display is comprised of four lines of 80 characters each. The two top lines display the steps to be taken, and the two bottom lines display the prompts which define the 10 function keys on the Attendant Console. For additional information, refer to the Customer Data Entry Information, Section MITL9108-093-210-NA, and the Attendant Console Description, Section MITL9108-093-315-NA.

## 2. PHYSICAL DESCRIPTION

### General

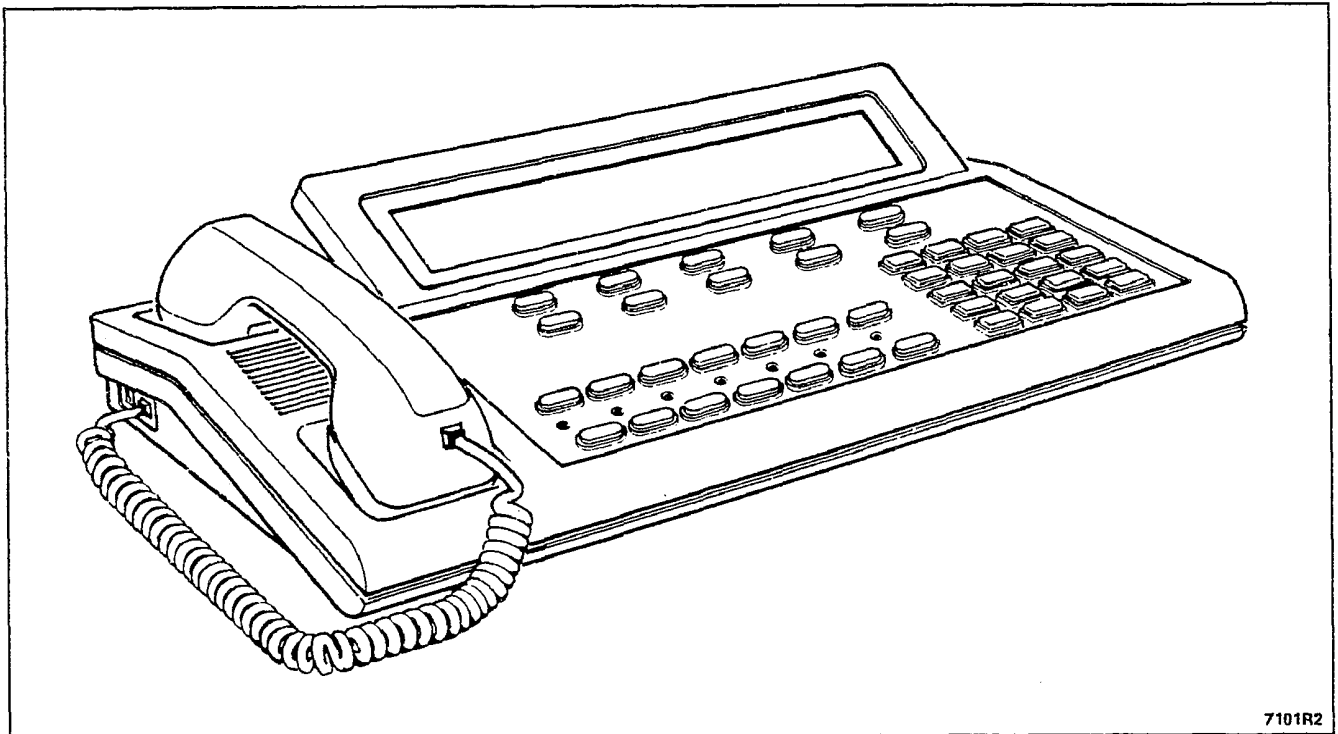
2.01 The SX-200<sup>®</sup> DIGITAL PABX is available in two configurations, in a range of sizes from 144 ports to 480 ports, and supports a range of equipment, as described following.

### Attendant Console

2.02 The Attendant Console is illustrated in Figure 2-1 and measures 39.4 cm (15.5 inches) long, 10.2 cm (4.0 inches) high, and 22.9 cm (9.0 inches) deep. The Attendant Console consists of a handset, 44 nonlocking pushbutton keys, seven LEDs and a Liquid Crystal Display (LCD). The LCD area measures 27.3 cm (10.7 inches) long and 3.8 cm (1.5 inches) wide. The LCD provides a display of four lines, each capable of displaying up to 80 characters.

### Control Cabinet

2.03 The SX-200<sup>®</sup> DIGITAL PABX Control cabinet (Figure 2-2) consists of a metal frame enclosed by back, top, and side panels. It contains a 144 port digital Control shelf in the lower position and a maintenance panel at the top of the cabinet. The digital Control shelf has Bay 1 on the left and Bay 2 on the right. Access to the Bays is through the front door of the cabinet. The rear door allows access to line, trunk, and PCM cable entries. The PABX can be expanded by



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Figure 2-1 SX-200<sup>®</sup> Attendant Console

## General Description

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adding a 120-port shelf (Bay 3) above the Control shelf.

**Bay 1 contains:** 1 Bay Power Supply and 8 Digital Peripheral cards.

**Bay 2 contains:** 1 Main Control Card, 1 Bay Power Supply, 1 Floppy Disk Drive and 4 Digital Peripheral Cards.

**Bay 3 contains:** 1 Peripheral Control Card, 1 Scanner card, 1 Digital Interface Card and 15 Peripheral cards.

### Universal Cabinet

**2.04** The Universal cabinet is similar to the existing Control cabinet.

The major differences are: its maintenance panel is located immediately above the digital Control shelf, its Floppy Disk Drive plugs directly into the backplane, it can have a digital Peripheral shelf, and its Main Control Card directly controls up to three 6-circuit Power Fail Transfer cards. The SX-200<sup>®</sup> DIGITAL PABX in the Universal cabinet can be expanded by installing either a 120-port shelf or a 192-port shelf above the maintenance panel. The SX-200<sup>®</sup> DIGITAL PABX 480-port configuration Control cabinet (Figure 2-3) is created by installing a 120-port shelf (Bay 3) above the Control shelf (Generics 1000 and 1001 software); an optional 216-port Peripheral cabinet (Bays 4 and 5) may be connected to the PABX. The SX-200<sup>®</sup> DIGITAL PABX 336-port configuration Control cabinet (Figure 2-4) is created by installing a 192-port digital shelf (Bays 3 and 4) above the Control shelf (Generic 1001 software only). Bays 3 and 4 are each similar to Bay 1 (the Bay 4 backplane does not have to be added concurrently with the shelf and Bay 3 backplane).

**Digital Bay 3 contains:** 1 Bay Control card, 1 Bay Power Supply and 8 Digital Peripheral cards.

**Digital Bay 4 contains:** 1 Bay Control card, 1 Bay Power Supply and 8 Digital Peripheral cards.

### Peripheral Cabinet

**2.05** The SX-200<sup>®</sup> DIGITAL PABX 480-port configuration optional 216-port Peripheral cabinet (Figure 2-5) has a 120-port lower shelf (Bay 4) and an optional 96-port upper shelf (Bay 5) which are connected to and controlled by the Control shelf.

**Bay 4 contains:** 1 Peripheral Control Card, 1 Scanner card, 1 Digital Interface Card and 15 Peripheral cards.

**Bay 5 contains:** 1 Digital Interface Card and 12 Peripheral cards.

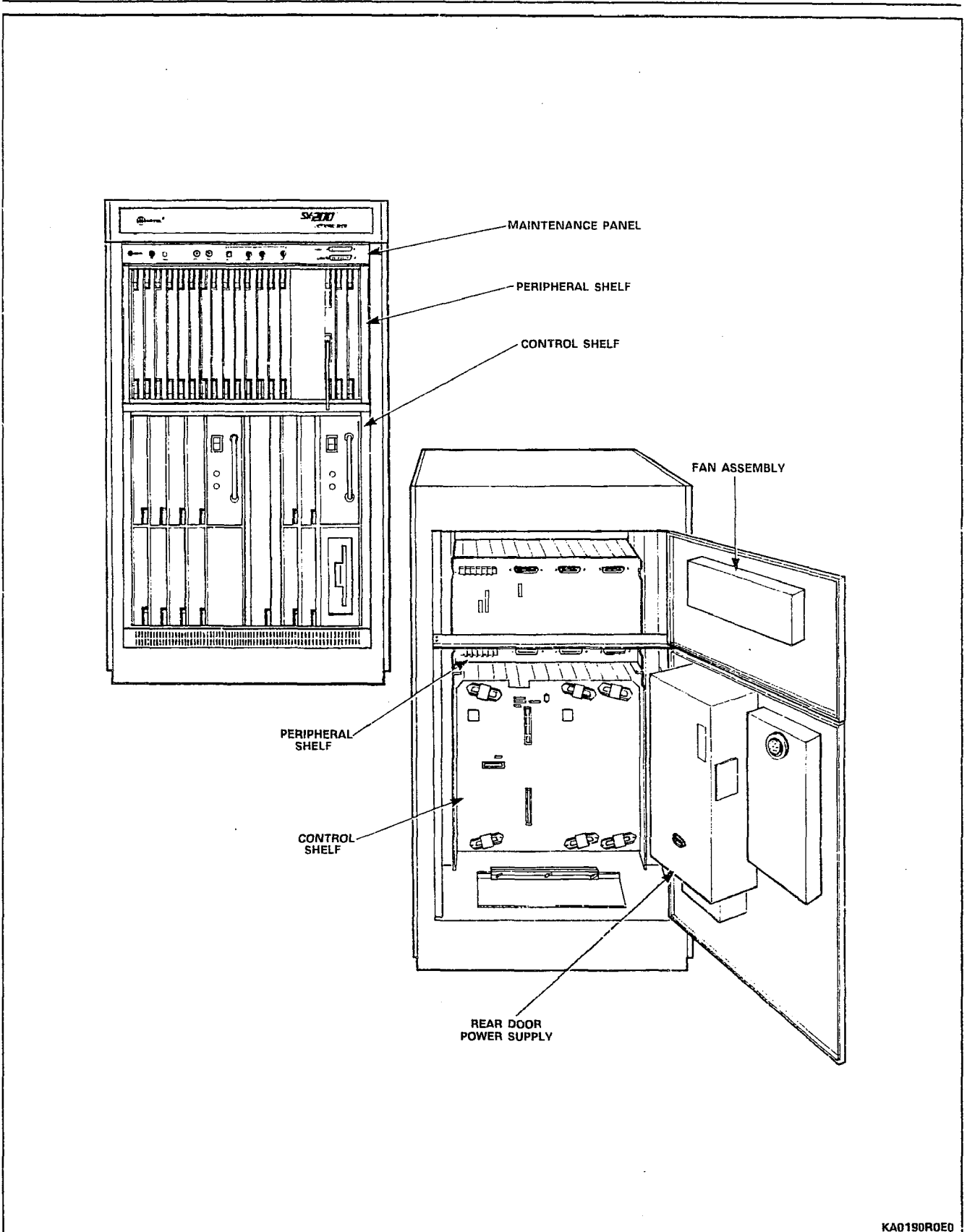


Figure 2-2 SX-200<sup>®</sup> DIGITAL PABX Control Cabinet

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# General Description

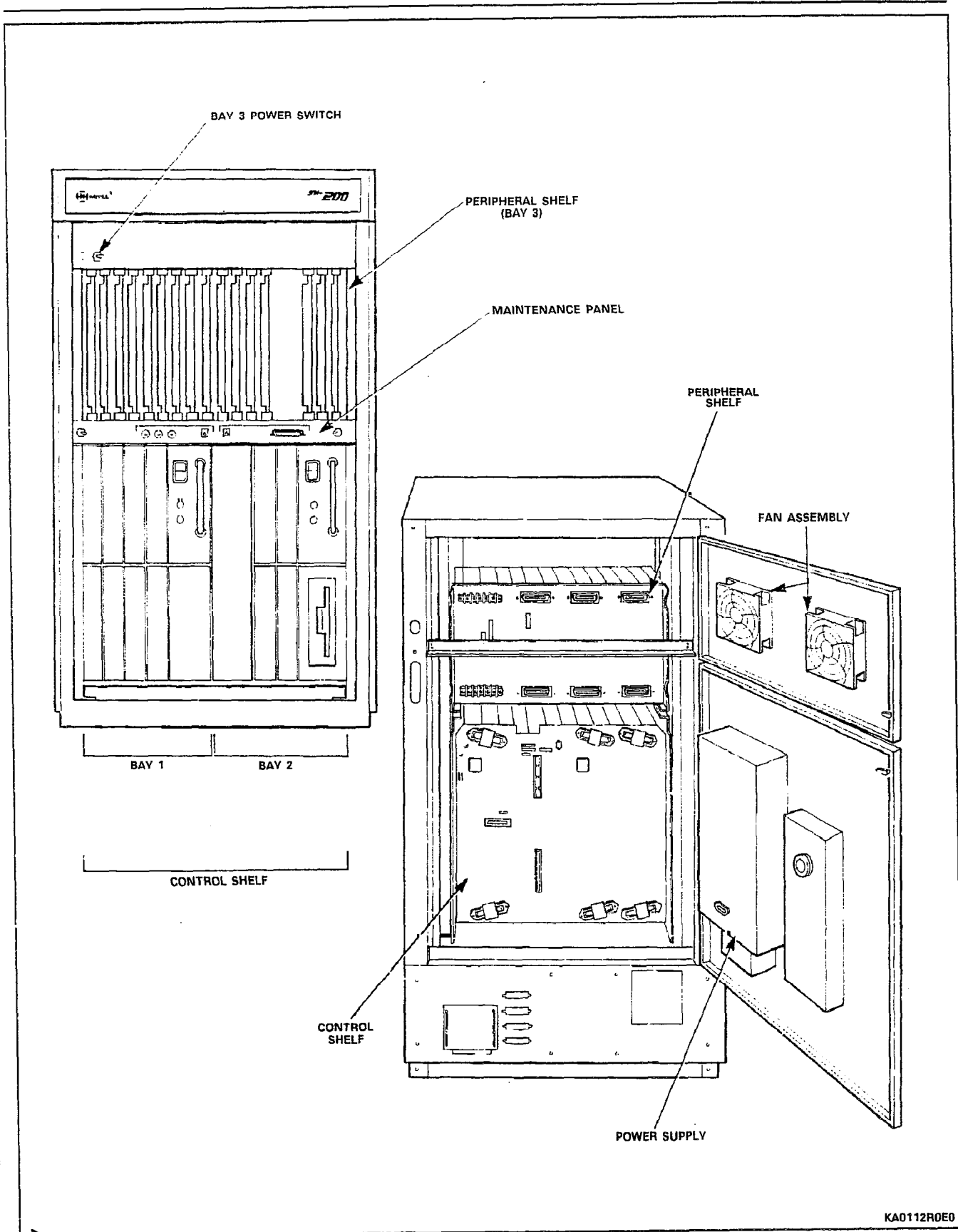
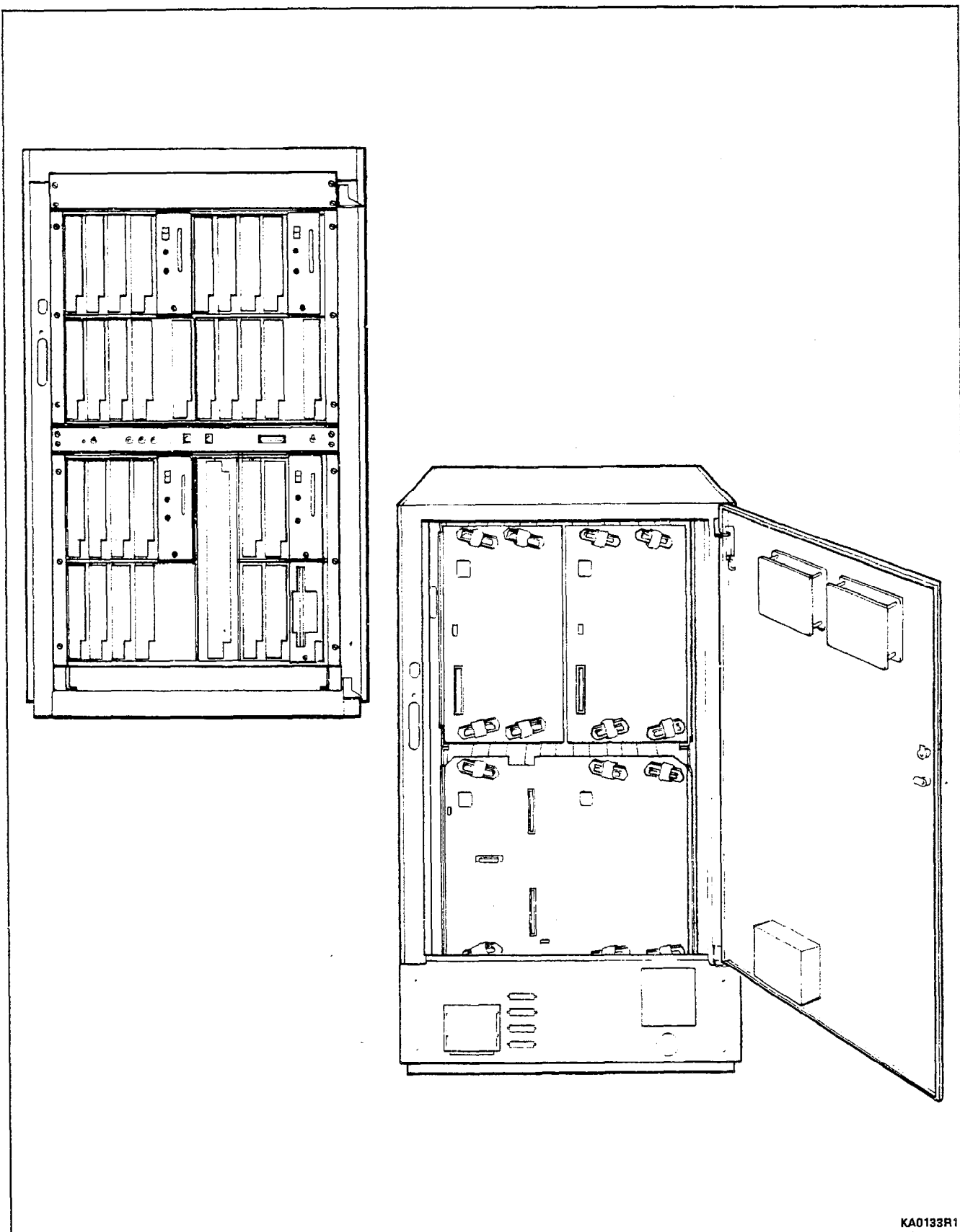


Figure 2-3 SX-200® DIGITAL PABX Universal Control Cabinet



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Figure 2-4 SX-200<sup>®</sup> DIGITAL PABX Universal Control Cabinet with Digital Peripheral Shelf

# General Description

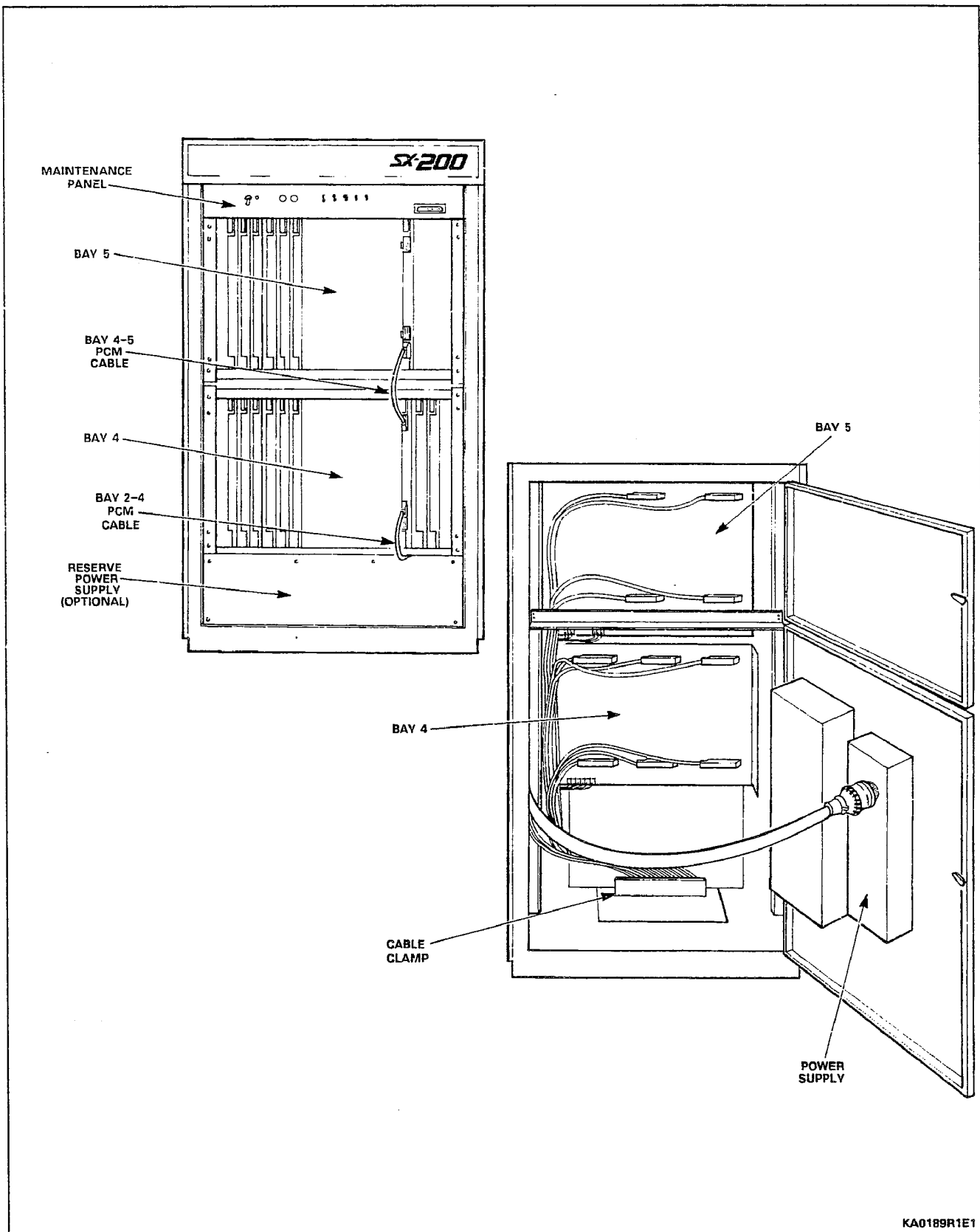


Figure 2-5 SX-200<sup>®</sup> DIGITAL PABX Peripheral Cabinet

**2.06** Power Fail Transfer cards are also provided to enable preselected extensions using DTMF or Rotary sets to access a CO trunk in the event of system power failure.

**2.07** Two Maintenance Panels are provided. The Control Cabinet Maintenance Panel consists of connections for a test line, a jack for a maintenance Attendant Console, a maintenance terminal and power fail transfer switches. The test line is connected via Tip, Ring and Ground connections or via a standard modular phone jack. The Peripheral Cabinet Maintenance Panel is not functional, with the exception of the POWER switch, and the PFT POWER SUPPLY, COMMON CONTROL and MASTER SWITCH switches.

### **Power Supplies**

**2.08** System power is derived from four power supplies: two bay power supplies, one located in bay 1 and one in bay 2; and two rear panel power supplies, one for bay 3, and one for bays 4 and 5.



**3. SYSTEM REQUIREMENTS**

**3.01** The environmental and electrical requirements for the SX-200<sup>®</sup> PABX are shown in Tables 3-1 and 3-2 respectively.

**TABLE 3-1  
SX-200<sup>®</sup> ENVIRONMENTAL REQUIREMENTS**

Height Per Cabinet	96.0 cm	38.0 inches
Width Per Cabinet	60.0 cm	23.5 inches
Depth Per Cabinet	70.0 cm	27.5 inches
Weight Fully Loaded	231.0 kg	580.0 pounds
Operating Temperature	10 to 40° C	50 to 104° F
Storage Temperature	-20 to 50° C	-4 to 122° F
Relative Humidity (Operating) (non-condensing)	20 to 80%	20 to 80%
Relative Humidity (Storage) (non-condensing)	10 to 90%	10 to 90%

**TABLE 3-2  
SX-200<sup>®</sup> ELECTRICAL REQUIREMENTS**

AC Input Voltage	102-135 Vac
AC Input Frequency	47-63 Hz
AC Input Power	125 Watts RMS for each bay
DC Output Power	100 Watts for each bay
Reserve Power	Uninterruptible Power Supply

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## 4. HARDWARE OVERVIEW

### General

**4.01** A block diagram of the SX-200<sup>®</sup> DIGITAL configuration (five bays) is shown in Figure 4-1. Figure 4-2 shows a block diagram of the SX-200<sup>®</sup> DIGITAL 336-port configuration (four digital bays). The heart of the system is the Main Controller, a 16-bit microprocessor operating at a clock frequency of 8 megaHertz. The Main Controller, through its address, data, and control buses, interfaces to a floppy disk unit, memory, Direct Memory Access Controller (DMAC), a Digital Signal Processor (DSP), a Message Subsystem, a DX Module, and 12 Digital Peripheral Cards. In the 480-port configuration, three Digital Interface Cards (DIC) communicate with Main Control Card via the DX module. In the 336-port configuration, the MCC controls Bays 3 and 4 through their Bay Control Cards.

### Main Control Card

**4.02** The Main Control Card (MCC) is shipped with two plug-in modules installed, the Memory Module, and the DX Module, and has provisions for accepting one Decryption Module. The MCC measures 35.8 cm (14.1 inches) long and 32.5 cm (12.8 inches) high. The Memory Module measures 26.9 cm (10.6 inches) long and 14.5 cm (5.7 inches) high. The DX Module measures 17.8 cm (7.0 inches) long and 13.5 cm (5.3 inches) high.

### Floppy Disk Drive

**4.03** All system software and Customer Data is stored on a 5.25-inch floppy disk drive. Upon power-up, Call processing and Maintenance routines are downloaded from the disk to the Main Controller Memory using Direct Memory Access (DMA). The Main Controller executes the Maintenance routines and logs all major occurrences to the disk, non-volatile random access memory, Main Control Card 7-segment displays, and the maintenance terminal (if equipped).

**4.04** When the system is functional, the software pertinent to the peripheral systems is downloaded from the Main Controller Memory to each Peripheral Controller's Memory. The transfer is accomplished via the Message Subsystem link, using a single 64 kilobit per second channel in each direction, for each Peripheral Controller (Peripheral Control Card or Bay Control Card).

### Message Subsystem

**4.05** The Message Subsystem is used as a communication link between the Main Controller and the Peripheral Controllers. Initially the Message Subsystem is used to download software from the Main Controller memory to the Peripheral Controllers' memory using two channels per peripheral bay (one in each direction). During system operation these same 64 kilobit per second channels are used as a communication link between the Main and Peripheral Processors. Messages are HDLC frames, ensuring error-free operation.

General Description

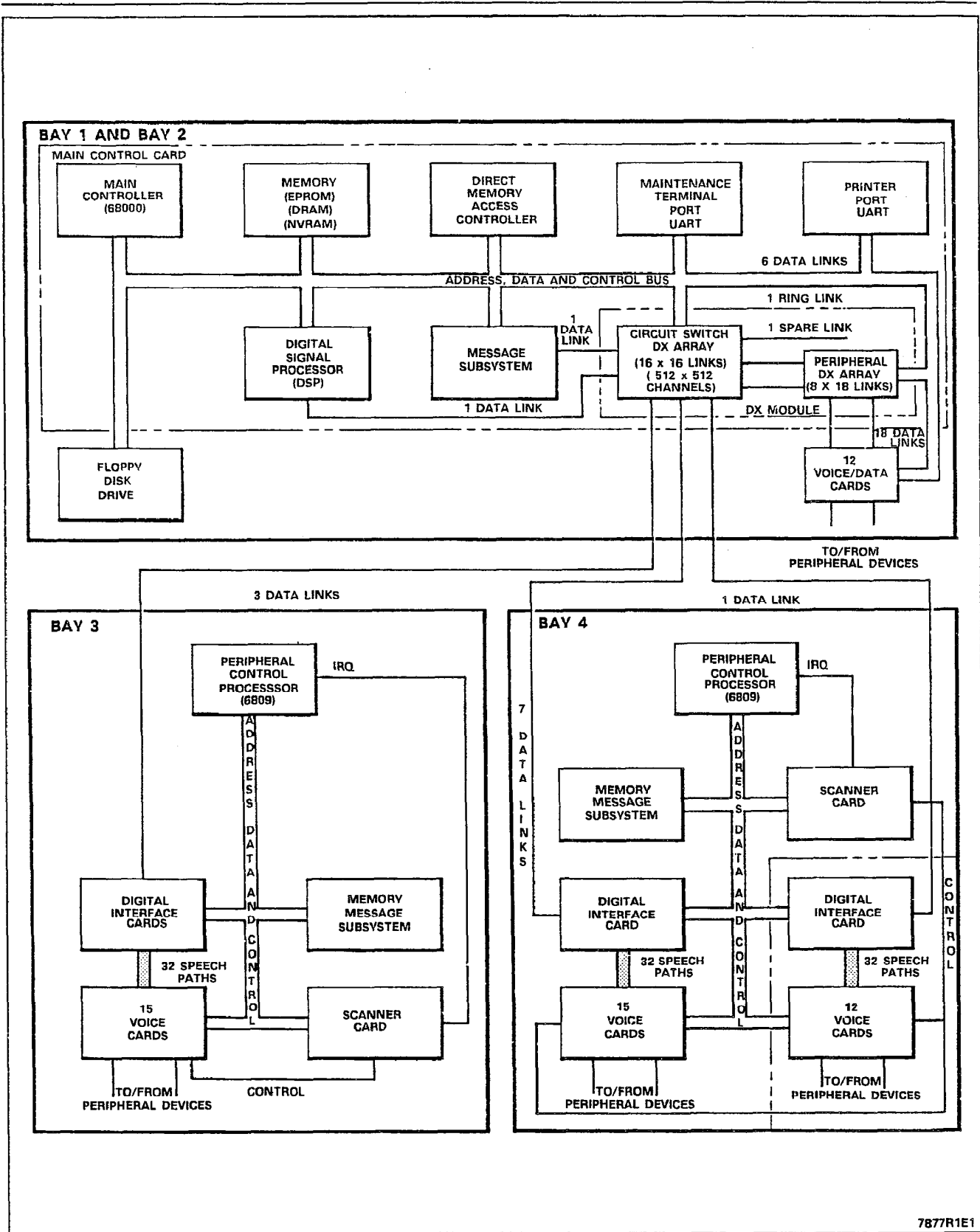
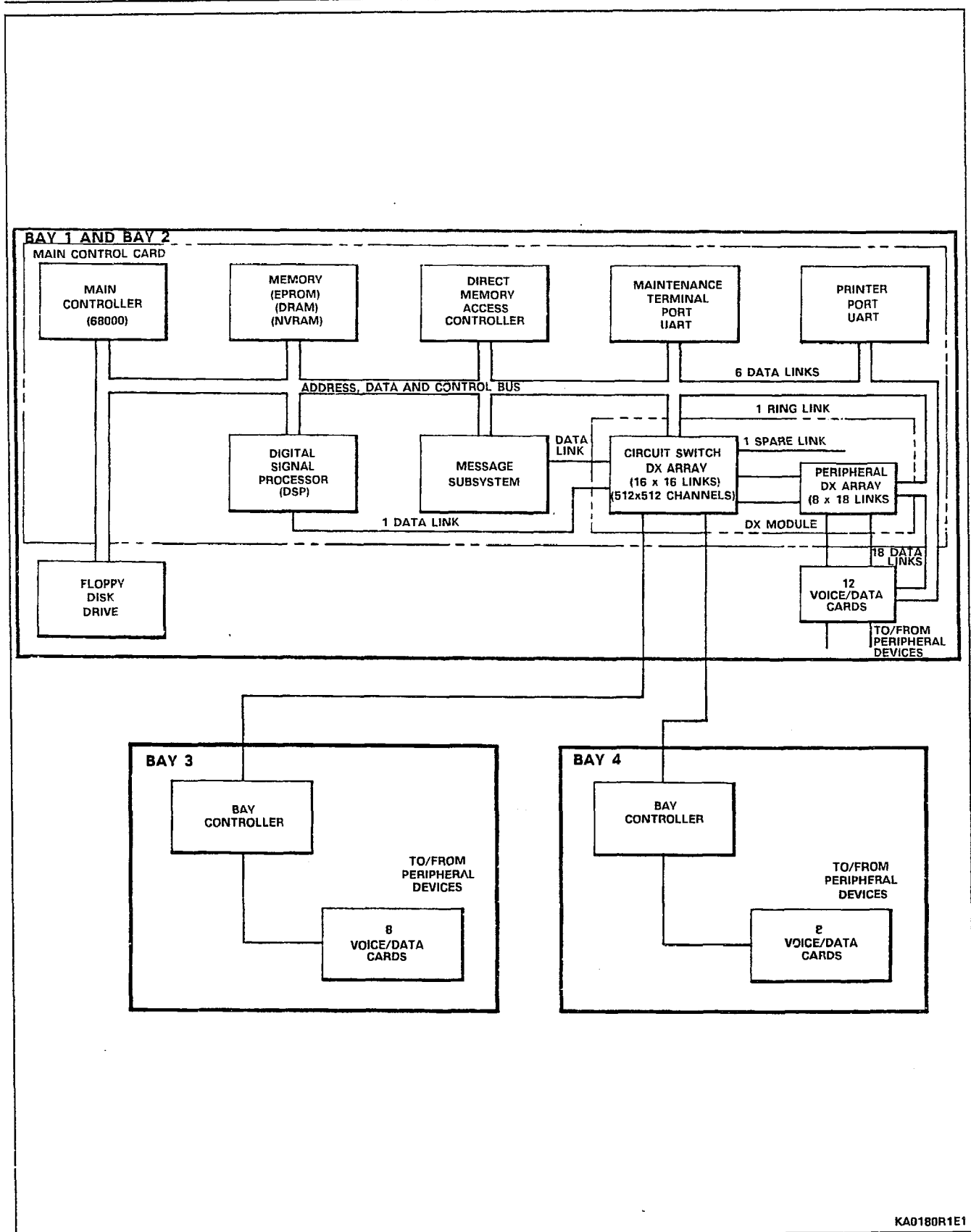


Figure 4-1 SX-200<sup>®</sup> DIGITAL PABX 480-Port Configuration Block Diagram



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Figure 4-2 SX-200<sup>®</sup> DIGITAL PABX 336-Port Configuration Block Diagram

### Digital Signal Processor (DSP)

**4.06** The system contains one Digital Signal Processor (DSP). The DSP is under the control of the Main Controller and is configured to provide the following:

- 1 Dial Tone Detector Channel (used for up to 50 trunks)
- 18 Channels of Conference (e.g., six 3-party conferences)
- 8 Channels of Dual Tone Generators.

### DX Module

**4.07** The DX Module includes a dynamic switch capable of assigning any one of 512 incoming channels to any one of 512 outgoing channels. The incoming channels are grouped into 16 incoming links containing 32 channels each. The outgoing channels are grouped into 16 outgoing links of 32 channels each. The 16 incoming and 16 outgoing links form a 16 X 16 link matrix. Each channel consists of 64 kilobits per second of information. The DX Module is therefore capable of handling a total incoming bit stream of 32.768 megabits of information per second. Note that switching occurs at the channel level, in 64 kbps segments.

**4.08** The DX Module contains two dx arrays: the main DX array, and the peripheral DX array. The main array consists of four DX integrated circuits to produce the 16 X 16 link matrix mentioned above. The peripheral array consists of three DX integrated circuits organized to connect the 18 bidirectional links of the peripheral cards to the six links required for bays 1 and 2.

**4.09** Each incoming link to the DX Module consists of a single wire containing up to 2.048 megabits per second of information (32 channels X 64 kilobits).

**4.10** The DX Module data links are allocated as follows:

- 1 link for the Digital Signal Processor (DSP)
- 1 link for the Message Subsystem
- 6 links for bays 1 and 2
- 1 link for ring reference and dial tone filtering
- 3 links for analog bay 3 or digital Bay 3
- 3 links for analog bays 4 and 5 or for digital Bay 4
- 1 link reserved

### Bay Control Card

4.11 The Bay Control Card interfaces the peripheral cards of Digital Bays 3 and 4 to the MCC (one BCC for each Bay).

### Peripheral Control Card

4.12 The Peripheral Control Card controls all basic functions of the analog Peripheral Cards. The Peripheral Bay controller system also handles real time tasks, such as rotary digit collection, tone cadencing, signaling on trunks, and monitoring hardware activity via the Peripheral Control Bus. All events are reported to the Main Controller via the Message Subsystem.

### Digital Interface Card

4.13 The Digital Interface Card provides an interface between the analog signals on the speech paths and the digital PCM links to the DX Module. The Digital Interface Card converts analog signals in the 300Hz - 3kHz band to PCM signals at 64 kilobits per second. The Digital Interface Card accepts 32 analog voice inputs to provide a 2.048 Mbit/s (32 X 64 kb/s) PCM output bit stream to the DX Module. This same card also converts a 2.048 Mb/s PCM bit stream from the DX Module to 32 analog voice signals, and provides the Message Subsystem interface.

### Scanner Card

4.14 The Scanner Card scans the Analog Peripheral ports to detect signals that require processor action. When processor action is required, an Interrupt Request (IRQ) is sent to the Peripheral Processor.

### Peripheral Cards

4.15 SX-200® DIGITAL PABX has Digital Peripheral Cards, each measuring 35.8 cm (14.1 inches) long and 15.8 cm (6.2 inches) high, which consist of the following:

- **Universal Card.** This card can handle various types of modules as listed below:
  - Receiver/Relay Module (4 DTMF Receivers and 2 Relays per Module)
  - Music On Hold/Pager Module
  - Console Module (console interfaces)
  - E&M Trunk Module.

Each module is assigned a power rating. The accumulated ratings of the modules on the universal card cannot exceed a value of 10. The ratings of the modules are as follows:

## General Description

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- Receiver/Relay Module: 2
- Music On Hold/Pager Module: 1
- Console Module: 5
- E&M Trunk Module: 3

For example, a Universal Card could be configured with two Console Modules (a total power rating of 10), or one Console Module, two Receiver/Relay Modules, and one Music On Hold/Pager Module ( $5 + 2 + 2 + 1 = 10$ ).

- **ONS Line Card.** There are 12 DTMF/Rotary line circuits per card. The card accepts up to three DTMF/Rotary telephone sets per line circuit. The ONS line card interfaces the DTMF/rotary telephone analog input with the system's digital crosspoint network. Its purpose, then, is to convert the analog telephone signals into the digital format used by the system, and to convert the digital information back into the analog signals required by the telephone sets.
  - **LS/GS Trunk Card.** This card accepts up to six loop start or ground start trunks (jumper-selectable) and has two message registration inputs.
  - **Control Over Voice (COV) Line Card.** The COV Line card interfaces a SUPERSET 3™ set or a SUPERSET 4™ set to the PABX. Each COV card connects six SUPERSET® sets to the PABX, and can plug into an upper slot of any digital Bay.
  - **Direct Inward Dial (DID) Trunk Card.** The DID trunk card contains six 1-way Direct Inward Dial circuits. It plugs into an upper (high power) slot of any digital Bay. The DID trunk allows incoming trunk calls to dial directly to an extension within the PABX from the public network, without Attendant intervention.
  - **Off-Premise (OPS) Line Card.** The OPS line card interfaces the PABX to extensions which are part of the system, but are located in a different building from the PABX. It contains additional protection circuitry to protect the PABX from extraneous high voltages or induced currents that may appear on the line. The OPS line card plugs into an upper (high power) slot of any digital Bay. Each OPS card connects with up to six extensions.
- 4.16** The Peripheral Cards, each measuring 32.5 cm (13 inches) long and 25.0 cm (10.0 inches) high, which can be installed consist of the following:
- **8-station Line Card.** This card accepts up to eight DTMF/Rotary telephone sets.
  - **CO Trunk Card.** This card is capable of handling four CO trunks (LS/GS).

- **SUPERSET<sup>®</sup> Line Card.** This card accepts up to eight SUPERSET 3<sup>™</sup> or SUPERSET 4<sup>™</sup> electronic telephone sets (maximum of eight cards per cabinet). A total of 128 SUPERSET<sup>®</sup> sets can be supported by the system.
- **E & M Trunk Card.** This card provides two 2- or 4-wire E & M tie trunks.
- **DID/Loop Tie Trunk Card.** This card provides two Direct Inward Dial trunks or loop tie trunks.



## 5. SOFTWARE OVERVIEW

### General

5.01 The SX-200<sup>®</sup> DIGITAL PABX software is divided into two separate sections, one to run the Main Control processor and one to run the Peripheral Control processors. Each software section has its own layers to carry out system functions. The layers defined below apply to both controllers unless otherwise specified.

### Physical Layer

5.02 The physical layer consists of the operating hardware such as the microprocessor, its associated memory and input/output devices.

### Scheduling Layer

5.03 This layer provides for scheduling of the different events to be handled.

### Communications Layer

5.04 This layer takes care of the Message Subsystem software. The messages between the processors are sent in HDLC formatted packets. The formatting, sending, receiving, and unpacking of these messages is handled by the Message Subsystem software. Messages are transmitted using a single 64 kb/s channel in each direction.

### Device Input/Output Layer

5.05 This layer handles low level details of interfacing to input/output devices such as telephony devices and RS-232 ports.

### Utilities Layer

5.06 This software layer provides general utilities needed for resource management, error handling, and command interpretation.

### Applications Layer

5.07 This software layer exists only in the Main Control Processor software. This layer provides the Call Processing which interprets the Classes of Service, as well as System Abbreviated Dial and Personal Speed Dial, Automatic Route Selection, etc.

### Main Control Processor Software

5.08 The Main Control Processor software is responsible for controlling all activities in the SX-200<sup>®</sup> DIGITAL PABX. It communicates with the peripheral processors via the Communications software layer for such things as "origination", "digits received", etc. Ap-

plications such as Call Processing, Customer Data Entry, and Maintenance management are provided for in the Main Control Processor software.

### **Peripheral Control Processor Software**

**5.09** The peripheral processors handle tasks that are real-time intensive, such as debouncing switchhooks, collecting rotary dial pulses, tone cadencing, and signaling on trunks. The peripheral processors are also responsible for monitoring hardware activity, such as cards being added and removed, and reporting all events to the Main Control Processor via the Message Subsystem.

### **Database**

**5.10** The Call Processing software is stored on floppy disk. Upon system power-up, the disk data is transferred to the Main Control Dynamic Random Access Memory. Customer Data Entries are kept on floppy disk for retrieval in case of major system failures. Other system information such as flash hook timing, trunk timings, and rotary digit translation for different countries, is routed to the Peripheral Control systems for processing.

6. CONFIGURATIONS

General

6.01 The SX-200<sup>®</sup> DIGITAL PABX is available in a 480-port configuration and a 336-port fully digital configuration. In either configuration, the PABX can be expanded modularly from a basic to a full configuration.

6.02 **SX-200<sup>®</sup> DIGITAL PABX 480-Port Configuration** - The SX-200<sup>®</sup> DIGITAL 480-port configuration, with either Generic 1000 or Generic 1001 software, has six configurations in either one or two cabinets. In the Control cabinet, the digital Control shelf has Bay 1 on the left and Bay 2 on the right; the optional Peripheral shelf is Bay 3. In the Peripheral cabinet, the lower and upper shelves are Bays 4 and 5 respectively. The configurations are:

Bays 1, 2	Control shelf (digital) only (single cabinet)
Bays 1, 2, 3	Control shelf plus Peripheral shelf (single cabinet)
Bays 1, 2, 4	Control shelf and lower shelf of Peripheral cabinet
Bays 1, 2, 4, 5	Control shelf and both shelves of Peripheral cabinet
Bays 1, 2, 3, 4	Control shelf plus Peripheral shelf, and lower shelf of Peripheral cabinet
Bays 1, 2, 3, 4, 5	Control shelf plus Peripheral shelf, and both shelves of Peripheral cabinet

The maximum ports available for each configuration, are:

Bays 1, 2	144 voice/data ports
Bays 1, 2, 3	144 voice/data ports plus 120 voice ports
Bays 1, 2, 4	144 voice/data ports plus 120 voice ports
Bays 1, 2, 4, 5	144 voice/data ports plus 216 voice ports
Bays 1, 2, 3, 4	144 voice/data ports plus 240 voice ports
Bays 1, 2, 3, 4, 5	144 voice/data ports plus 336 voice ports

6.03 **SX-200<sup>®</sup> DIGITAL PABX 336-Port Configuration** - The SX-200<sup>®</sup> 336-Port Configuration with Generic 1001 software and the Universal cabinet is available with a digital Control shelf, an optional digital Peripheral shelf, in the following configurations:

Bays 1, 2	Control shelf (digital)
Bays 1, 2, 3	Control shelf plus one digital Peripheral Bay
Bays 1, 2, 3, 4	Control shelf plus two digital Peripheral Bays

The maximum ports available for each configuration are:

Bays 1, 2	144 voice/data ports
Bays 1, 2, 3	240 voice/data ports
Bays 1, 2, 3, 4	336 voice/data ports

All configurations are compatible with most existing station, key telephone, private branch exchange, and central office equipment, and provide:

**General Description**

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- use of a flexible numbering plan
- simultaneous use of DTMF and rotary dial stations
- optional use of attendant consoles
- extensive selection of standard and optional features
- data port facility for traffic analysis and other requirements
- automatic diagnostics
- six to 36 power fail transfer trunks
- optional reserve power supply or uninterruptible power supply
- SUPERSET 3™ set
- SUPERSET 4™ set.

**6.04 SX-200® 480-Port Configuration** - The SX-200® 480-port configuration can be equipped as follows:

<u>Bay</u>	<u>Control Card(s)</u>	<u>Optional Peripheral Cards</u>
2	MCC, BPS, FDD	ONS, LS/GS, Universal, COV, DID, OPS (up to 04)
1	BPS	ONS, LS/GS, Universal, COV, DID, OPS (up to 08)
3	DIC, PCC, Scanner	CO Trk, Line, SUPERSET, E&M Trk, DID/Tie (up to 15)
4	DIC, PCC, Scanner	CO Trk, Line, SUPERSET, E&M Trk, DID/Tie (up to 15)
5	DIC	CO Trk, Line, SUPERSET, E&M Trk, DID/Tie (up to 12)

**Note:** Each bay in use must have all its Control cards present. Peripheral cards are installed as required.

<u>Card Type</u>	<u>Description</u>
MCC	Main Control Card
BPS	Bay Power Supply
FDD	Floppy Disk Drive
DIC	Digital Interface Card
PCC	Peripheral Control Card
Scanner	Scanner Card
ONS	On-site Line Card (12 circuit)
LS/GS	Loop Start/Ground Start CO Trunk Card (6 circuit)
Universal	Universal Card (accepts up to four modules)
DID	Direct Inward Dial Trunk Card (6 circuit)
OPS	Off-premises Line Card (6 circuit)
COV	Control Over Voice Line Card (6 circuit) (for SUPERSET® sets)
CO Trk	CO Trunk Card (4 circuit)
Line	Line Card (8 circuit)
SUPERSET	SUPERSET® set Line Card (8 circuit)
E&M Trk	E&M Trunk Card (2 circuit)
DID/Tie	Direct Inward Dial or Tie Trunk (2 circuit)

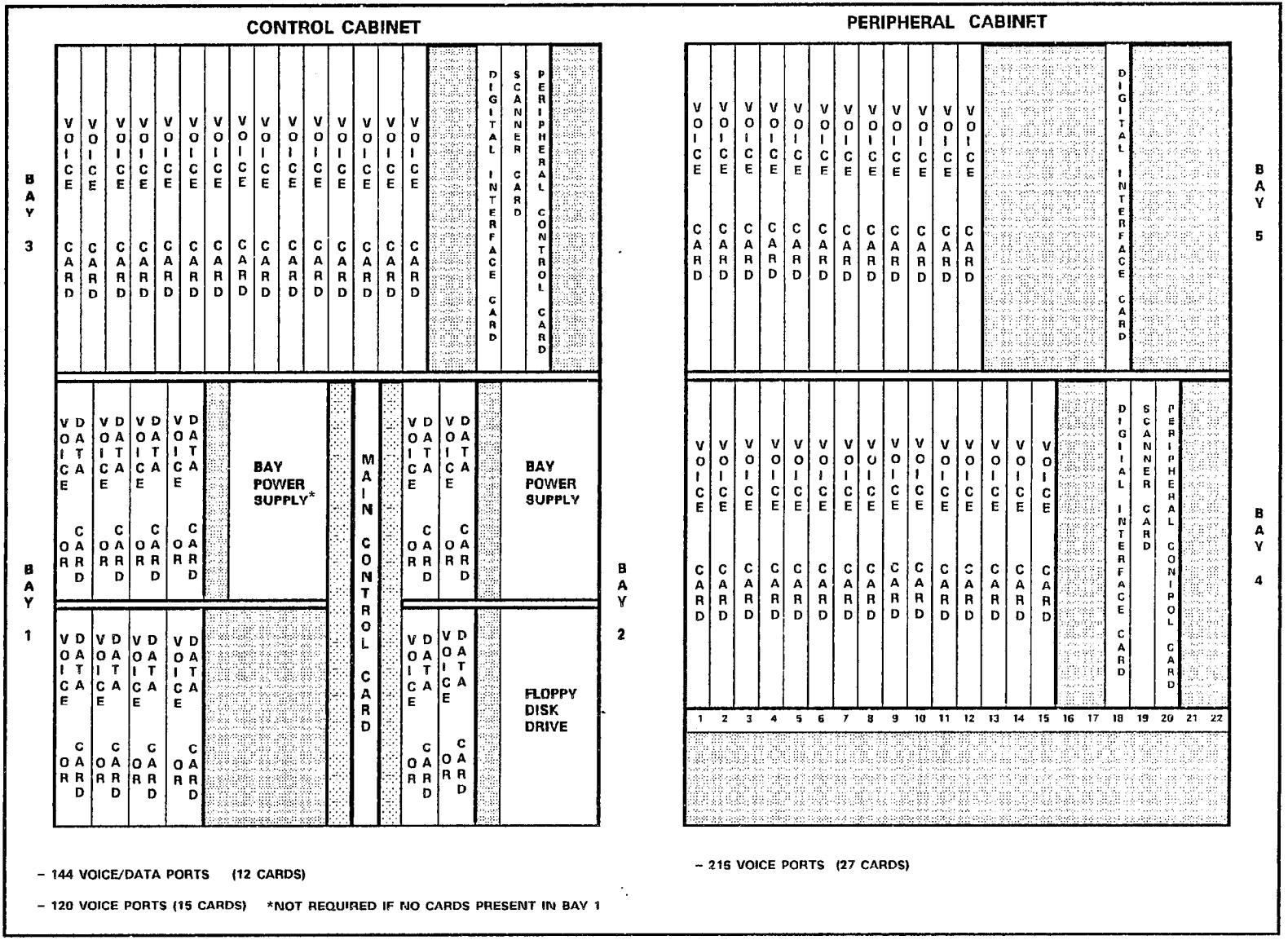
**6.05 SX-200<sup>®</sup> 336-Port Configuration** - If a digital shelf is added to the Universal Cabinet, the SX-200<sup>®</sup> 336-port configuration can be equipped as follows:

<b>Bay</b>	<b>Control Card(s)</b>	<b>Optional Peripheral Cards</b>
2	MCC, BPS, FDD	ONS, LS/GS, Universal, COV, DID, OPS (up to 04)
1	BPS	ONS, LS/GS, Universal, COV, DID, OPS (up to 08)
3	BPS, BC	ONS, LS/GS, Universal, COV, DID, OPS (up to 08)
4	BPS, BC	ONS, LS/GS, Universal, COV, DID, OPS (up to 08)

**Note:** Each bay in use must have all its Control cards present. Peripheral cards are installed as required.

<b>Card Type</b>	<b>Description</b>
MCC	Main Control Card
BPS	Bay Power Supply
BC	Bay Controller
FDD	Floppy Disk Drive
ONS	On-Site Line Card (12 circuit)
LS/GS	Loop Start/Ground Start CO Trunk Card (6 circuit)
Universal	Universal Card (accepts up to four modules)
DID	Direct Inward Dial Trunk Card (6 circuit)
OPS	Off-premises Line Card (6 circuit)
COV	Control Over Voice Line Card for SUPERSET <sup>®</sup> sets (6 circuit)

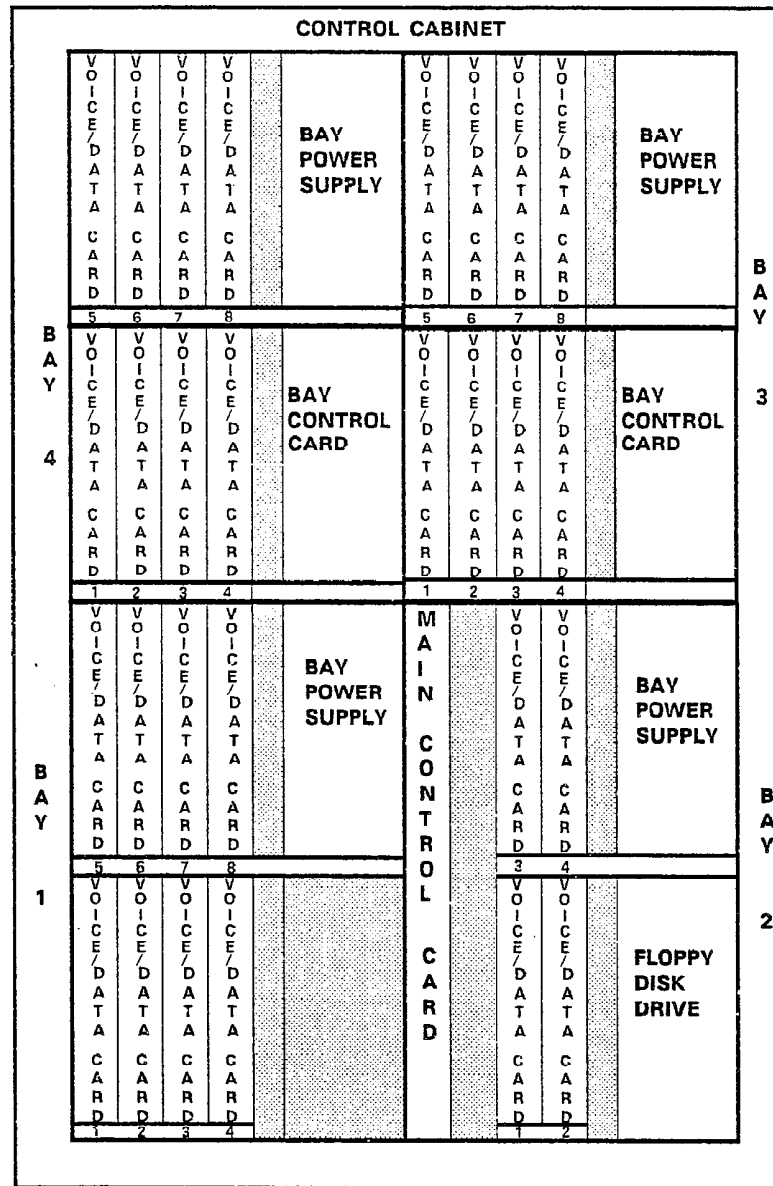
Figure 6-1 SX-200® DIGITAL 480-Port Configuration



- 144 VOICE/DATA PORTS (12 CARDS)

- 120 VOICE PORTS (15 CARDS) \*NOT REQUIRED IF NO CARDS PRESENT IN BAY 1

- 216 VOICE PORTS (27 CARDS)



**VOICE/DATA CARDS**  
 6 CCT/CARD TRUNK  
 12 CCT/CARD REGULAR  
 6 CCT CONTROL OVER VOICE  
 6 CCT OFF PREMISE STATION  
 6 CCT DIRECT INWARD DIAL  
 UNIVERSAL

Figure 6-2 SX-200® DIGITAL PABX 336-Port Configuration

## 7. SX-200® DIGITAL PABX FEATURES

7.01 The following lists identify the features that are available with Generic 1000 (Basic Business) software and Generic 1001 (Advanced Business-Hotel/Motel) software.

## SYSTEM FEATURE LIST

Feature	Generic 1000	Generic 1001
Abbreviated Dial (System Speed Call)	✓	✓
Abbreviated Dial Entry via CDE Form		✓
Account Codes (nonverified)	✓	✓
Account Codes (verified)		✓
Alarm Indication (minor, major, critical)	✓	✓
Associated Modem Line		✓
Attendant Automatic Call Forward No Answer	✓	✓
Automatic Diagnostics	✓	✓
Automatic Route Selection (ARS)	✓	✓
Call Rerouting Tables	✓	✓
Class-of-Service (COS)	✓	✓
Class-of-Restriction (COR)	✓	✓
Conflict Dialing	✓	✓
Consoleless Operation	✓	✓
Contact Monitor	✓	✓
Customer Programming and Security	✓	✓
Customer Data Entry (CDE)	✓	✓
CDE Separate Access		✓
Backup and Restore	✓	✓
Customer Database Printouts		✓
Data Demultiplexor	✓	✓
Default Customer Data	✓	✓
Dial Access to Attendant	✓	✓
Dialing Plan	✓	✓
Dictation Trunks	✓	✓
Direct-In Lines (DILs)	✓	✓
Direct Inward Dialing (DID)	✓	✓
DID with Intercept to Recording		✓
DID Trunk Support		
- Control Shelf		✓
- Peripheral Shelves	✓	✓
Direct Inward System Access (DISA)	✓	✓
Discriminating Ringing	✓	✓
DTMF to Rotary Conversion	✓	✓
E&M Trunk Support		
-Control Shelf		✓
-Peripheral Shelves	✓	✓
Extension Transfer Security	✓	✓
Fixed Night Service	✓	✓
Flexible Night Service	✓	✓
Flexible Numbering Plan	✓	✓
Hang Up Priority	✓	✓



SYSTEM FEATURE LIST (CONT'D)

Feature	Generic 1000	Generic 1001
Hunt Groups	✓	✓
Immediate Ring	✓	✓
Inhibit Automatic Supervision	✓	✓
Limited Wait for Dial Tone	✓	✓
Line Lockout Alarm	✓	✓
Message Waiting with Printouts	✓	✓
Multi-Attendant Positions	✓	✓
Multiple Trunk Groups	✓	✓
Music on Hold	✓	✓
Night Bells	✓	✓
Night Service Switching	✓	✓
Node Identification		✓
OPS Line Support		✓
Paging Access	✓	✓
Range Programming	✓	✓
Remote Maintenance	✓	✓
Resale Package		✓
Ringling Time-out	✓	✓
Rotary to DTMF Conversion	✓	✓
Station Message Detail Recording (SMDR)	✓	✓
SUPERSET support		
-128 max.	✓	
-158 max.		✓
Switchhook Flash Timer Options	✓	✓
System Identifier	✓	✓
Tenanting	✓	✓
Test Line Maintenance Access	✓	✓
Toll Control (Multi-Digit)	✓	✓
Tone Demonstration Package	✓	✓
Tone-to-Pulse Conversion	✓	✓
Traffic Measurement	✓	✓
Trunk Answer from Any Station (TAFAS) Day and Night	✓	✓
Trunk Camp-on Warning Tone	✓	✓
Trunk Group Labels		✓
Trunk Interconnection (CDE Forms)		✓
Uniform Call Distribution (UCD)		✓
Vacant Number Intercept to the Attendant	✓	✓
Variable Timers (fully programmable)	✓	✓
Verified Account Codes		✓

## ATTENDANT FEATURE LIST

Feature	Generic 1000	Generic 1001
Alarm Readout	✓	✓
Automatic Wake-up		✓
Bell Off	✓	✓
Busy Override	✓	✓
Call Blocking		✓
Callback Busy/No Answer	✓	✓
Call Forward Setup and Cancel	✓	✓
Call Selection: LDN Keys, Recall, Dial 0	✓	✓
Call Selection of Priority Dial 0	✓	✓
Called/Calling Name, Number, COS and COR Display	✓	✓
Call Splitting	✓	✓
Call Swapping	✓	✓
Calls Waiting Display	✓	✓
Camp-on	✓	✓
CO Trunk to Non-CO Trunk Connect	✓	✓
Date Display	✓	✓
Direct Trunk Select	✓	✓
DISA Code Setup Enable	✓	✓
Display of SUPERSET Messages	✓	✓
DND Setup and Cancel	✓	✓
English Console	✓	✓
Extension Busy-out	✓	✓
Flash over Trunk	✓	✓
French Console Operation		✓
Guest Room Features		✓
Hold Slots	✓	✓
Individual Directory Number	✓	✓
Inter-position Calling and Transfer	✓	✓
Last Number Redial	✓	✓
Liquid Crystal Display	✓	✓
Message Registration		✓
Message Register Printout		✓
Message Waiting Printout		✓
Message Waiting Setup and Cancel	✓	✓
New Call Tone	✓	✓
Night/Day Switching	✓	✓
Non-CO Trunk to Non-CO Trunk Connect	✓	✓
Override	✓	✓
Page Access	✓	✓
Paged Hold Slot Access	✓	✓
Programmable LDN Keys	✓	✓
Room Status		✓
Room Status Printout		✓
Ringer Volume Control	✓	✓
Serial Call	✓	✓
Soft-Function Keys	✓	✓
Station Busy-out	✓	✓
Time Display	✓	✓

General Description

---

ATTENDANT FEATURE LIST (CONT'D)

Feature	Generic 1000	Generic 1001
Timed Recall	✓	✓
Training Jack	✓	✓
Tone Signaling		✓
Trunk Busy-out	✓	✓
Trunk Group Busy Display		✓
Trunk-to-Trunk Connect	✓	✓
Wake-up, Automatic with Printout		✓

EXTENSION FEATURE LIST

Feature	Generic 1000	Generic 1001
Account Codes	✓	✓
Automatic Wake-up		✓
Broker's Call	✓	✓
Call Forwarding (five options)	✓	✓
Call Hold	✓	✓
Call Park		✓
Call Retrieve	✓	✓
Callback Busy (extension and outgoing trunk)	✓	✓
Camp-on	✓	✓
Cannot Dial a Trunk after Flashing Option	✓	✓
Cannot Dial a Trunk (if holding or in conference with a trunk)	✓	✓
CO Trunk to Non-CO Trunk Connect	✓	✓
Conferencing (up to five parties)	✓	✓
Data Security	✓	✓
Dialed Call Pickup	✓	✓
Directed Call Pickup	✓	✓
Direct Outward Dialing	✓	✓
Discriminating Dial Tone	✓	✓
Do Not Disturb	✓	✓
External Call Forwarding	✓	✓
Flash for Attendant	✓	✓
Flash Disable	✓	✓
Flash on Incoming/Outgoing Trunk	✓	✓
Hot Line	✓	✓
Hunt Groups	✓	✓
Inward Restriction (DID)	✓	✓
Line Lockout Alarm	✓	✓
Manual Line	✓	✓
Never a Consultee	✓	✓
Never a Forwardee	✓	✓
No Dial Tone	✓	✓
Non-Busy Extension	✓	✓
Originate Only	✓	✓
Override Security	✓	✓
Paging Access	✓	✓
Pickup Groups	✓	✓
Priority Dial 0	✓	✓
Receive Only	✓	✓
Reset	✓	✓
Speed Call	✓	✓
Transfer, Consultation Hold/Add On	✓	✓
Transfer Dial Tone	✓	✓
Transfer with Privacy	✓	✓
Trunk Answer From Any Station (TAFAS)	✓	✓

SUPERSET FEATURE LIST

Feature	Generic 1000	Generic 1001
Account Code Access	✓	✓
Add Held	✓	✓
Advisory Messages	✓	✓
ARS Most Expensive Route Warning Message	✓	✓
Auto-Answer	✓	✓
Background Music	✓	✓
Busy and Hold Indications	✓	✓
Call Announce	✓	✓
Call Duration Display	✓	✓
Call Forwarding Setup and Cancel with Indication	✓	✓
Call Forwarding Indicated on Calls Made and Incoming Calls	✓	✓
Call-Me-Back Messages	✓	✓
Call Hold (via hold button)	✓	✓
Call Hold Retrieve (via pressing line key)	✓	✓
Call Split	✓	✓
Call Swap	✓	✓
Called/Calling Party Identification	✓	✓
Callback (Busy and No Answer)	✓	✓
Camp-on	✓	✓
Camped-on Party Identification	✓	✓
Cancel	✓	✓
Date/Time Display	✓	✓
Delay Ring Line Appearances	✓	✓
Display Function	✓	✓
Do Not Disturb Setup and Cancel with Indication	✓	✓
End-to-End Signaling	✓	✓
English and French	✓	✓
Executive Busy Override	✓	✓
Handsfree Operation	✓	✓
Help Function	✓	✓
Immediate Line Selection	✓	✓
Immediate Ring Line Appearances	✓	✓
Last Number Redial	✓	✓
Loop Test	✓	✓
Messages Waiting Indication	✓	✓
Microphone On/Off	✓	✓
Multiline Appearance (key line and multiple call)	✓	✓
Music on Camp-on/Hold	✓	✓
Name Function	✓	✓
New Call Tone	✓	✓
Night Answer (TAFAS)	✓	✓
Night Switching (for Tenants)		✓
No Ring Line Appearances	✓	✓
Overriding Party Identification	✓	✓
Paging Access (all zones)	✓	✓
Pickup	✓	✓
Prime Line	✓	✓

SUPERSET FEATURE LIST (CONT'D)

Feature	Generic 1000	Generic 1001
Privacy Release	✓	✓
Ringer Tone Adjustment	✓	✓
Ringer Volume Control	✓	✓
Room Status Display		✓
Speaker On/Off	✓	✓
Speaker Volume Control	✓	✓
Speed Call Keys	✓	✓
Speed Call Feature Codes		✓
Sub-Attendant Recall	✓	✓
Swap Camp-on	✓	✓
Timed Reminder	✓	✓
Transfer/Conference	✓	✓
User Programmable	✓	✓

## 8. MAINTENANCE

### General

**8.01** This Part briefly describes the maintenance diagnostics for the SX-200<sup>®</sup> DIGITAL PABX. These diagnostics test the operation of the system hardware. The Main Control system has the responsibility of controlling and scheduling the diagnostics.

**8.02** Upon power-up or reset conditions, the diagnostics software (if enabled) has temporary control of the entire system. Once the system has been verified and the PABX is operational, the diagnostics run as low priority background tasks.

### Maintenance Objectives

**8.03** The objectives of the maintenance routines are to isolate a fault to a replaceable card or module. Maintenance functions can be performed from either the Attendant Console or an RS-232 terminal.

### RS-232 Terminal

**8.04** The Main Control system interfaces to an RS-232 maintenance terminal and to the Attendant Console in order to enable the user to access the diagnostic menu. The diagnostic menu will direct the user through the required procedures in order to interrogate the status of the diagnostic subsystem. The user can initiate maintenance routines with specific parameters via the terminal. The results can then be routed to the appropriate device (i.e., printer or terminal) according to the user's instructions.

### Diagnostic Log Files

**8.05** A file of the major occurrences in the diagnostic system is maintained on disk and/or in non-volatile RAM. This file can be directed to the RS-232 terminal, the Attendant Console or a printer.

### Types of Diagnostics

**8.06** There are two types of diagnostic routines as listed below:

1. Power-up
2. Background.

**8.07** The Power-up diagnostic routines consist of the complete set of diagnostics for the system. When enabled they are executed upon system power-up and may last several minutes. These diagnostics will perform a rigorous check on the response and performance of the hardware and firmware. Any failures will be logged to the LED display, the disk, the non-volatile RAM and the RS-232 terminal.

## General Description

---

**8.08** The Background diagnostic routines also consist of the complete routines which are run during system operation. When enabled they are executed as low priority background routines during system operation.



**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
FEATURES DESCRIPTION**

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CONTENTS	PAGE
1. INTRODUCTION .....	1-1
2. TYPES OF FEATURES .....	2-1
General .....	2-1
3. ATTENDANT FEATURES .....	3-1
Attendant Abbreviated Dial Programming, Access .....	3-2
Attendant Alarm Readout .....	3-3
Attendant Bell-Off .....	3-4
Attendant Busy Override .....	3-5
Attendant Call Announce .....	3-6
Attendant Call Block Setup .....	3-7
Attendant Callback - Busy/No Answer .....	3-8
Attendant Call Forward Setup and Cancel .....	3-9
Attendant Call Selection: LDN, Recall, Internal .....	3-11
Attendant Called And Calling Name, Number, COS, COR Display .....	3-13
Attendant Call Splitting And Swapping .....	3-14
Attendant Calls Forwarded On No Answer .....	3-15
Attendant Calls Waiting Display .....	3-16
Attendant Camp-On .....	3-17
Attendant CCSA Access .....	3-18
Attendant Conference .....	3-19
Attendant Console Lockout .....	3-20
Attendant Date and Time Display .....	3-21
Attendant Destination Key .....	3-22
Attendant Direct Trunk Select .....	3-23
Attendant DISA Code Setup Enable .....	3-24
Attendant Display and Setup of SUPERSET 4™ Set Messages .....	3-25
Attendant Do Not Disturb (DND) Setup and Cancel .....	3-26
Attendant Extension Busy-Out .....	3-27
Attendant Flash Over Trunk .....	3-28
Attendant Function Access .....	3-29
Attendant Guest Room Functions .....	3-30
Attendant Hold Slots .....	3-31
Attendant Individual Directory Number .....	3-32
Attendant Interposition Calling and Transfer .....	3-33
Attendant Last Number Redial .....	3-34
Attendant Message Register Audit .....	3-35
Attendant Message Waiting Setup and Cancel .....	3-36
Attendant New Call Tone .....	3-38
Attendant Night/Day Switching .....	3-39
Attendant Outgoing Call Restriction Setup .....	3-40
Attendant Page Access .....	3-41
Attendant Paged Hold Slot Access .....	3-42
Attendant LDN Keys .....	3-44
Attendant Ringer Volume Control .....	3-45
Attendant Serial Call .....	3-46

CONTENTS (CONT'D)		PAGE
Attendant Softkey Functions .....		3-47
Attendant Source Key .....		3-48
Attendant-Timed Recall .....		3-49
Attendant Tone Signaling .....		3-50
Attendant Training Jacks .....		3-51
Attendant Trunk Busy-Out Enable .....		3-52
Attendant Trunk Group Status Display .....		3-53
French Language Console Display .....		3-54
<b>4. SYSTEM FEATURES .....</b>		<b>4-1</b>
Abbreviated Dial .....		4-2
Account Codes .....		4-3
Alarm Indication .....		4-4
Associated Modem Line .....		4-5
Automatic Diagnostics .....		4-6
Automatic Number Identification (ANI) .....		4-7
Automatic Route Selection (ARS) Access .....		4-8
Automatic Wake-up .....		4-9
Call Forwarding - Busy, Busy/No Answer (System - DID, CCSA, Dial-in Tie Trunks) .....		4-11
Call Rerouting .....		4-12
Class Of Restriction (COR) .....		4-13
Class Of Service (COS) .....		4-14
CO (LS/GS) Trunk Support .....		4-15
Common-Controlled Switching Arrangement (CCSA) Trunk Support .....		4-16
Conferencing .....		4-17
Conflict Dialing .....		4-18
Consoleless Operation .....		4-19
Contact Monitor .....		4-20
Customer Data Entry (CDE) .....		4-21
Customer Data Entry (CDE) Backup and Restore .....		4-22
Customer Data Print .....		4-23
Data Demultiplexer .....		4-24
Default Customer Data .....		4-25
Device Interconnection .....		4-26
Dial Access to the Attendant .....		4-27
Dictation Trunks .....		4-28
Digit Translation .....		4-29
Direct Inward Dial (DID) Trunk Support .....		4-31
DID Intercept To Recorded Announcement .....		4-33
Direct-In Lines (DIL) .....		4-34
Direct Inward System Access (DISA) .....		4-35
Direct To ARS .....		4-37
Discriminating Ringing .....		4-38
DTMF-to-Rotary Dial Conversion .....		4-39
E&M Trunk Support .....		4-40
Fixed Night Service .....		4-41
Flash Package .....		4-42
Flexible Night Service .....		4-43

---

CONTENTS (CONT'D)	PAGE
Flexible Numbering Plan	4-44
Hang Up Priority	4-45
Hotel/Motel Features	4-46
Hunt Groups	4-47
Illegal Access Intercept	4-49
Immediate Ring	4-50
Inhibit Overlap Outpulsing	4-51
Last Party Receives Dial Tone	4-52
Limited Wait for Dial Tone	4-53
Line Lockout	4-54
Line Lockout Alarm	4-55
Local Switching	4-56
Message Registration	4-57
Message Waiting	4-58
Multi-Attendant Positions	4-59
Multiple Extensions	4-60
Music On Hold (MOH)	4-61
Night Bells	4-62
Night Services	4-63
Node Identification	4-64
Off-Premise Extension	4-65
Paging Equipment	4-66
Pickup Groups	4-67
Power Fail Transfer (PFT)	4-68
Printer Support	4-69
Programmable LDN Numbers	4-70
Range Programming of Stations and SUPERSET® Sets	4-71
Resale Package	4-72
Ringling Plan	4-73
Ringling Time-out	4-74
Room Status	4-75
Rotary-to-DTMF Conversion	4-77
Satellite PBX	4-78
Station Message Detail Recording (SMDR)	4-79
Station Transfer Security	4-80
SUPERSET 3™ Set	4-81
SUPERSET 4™ Set	4-82
Switchhook Flash Timer Options	4-84
System Identifier	4-85
Tandem Operation	4-86
Tenanting	4-87
Toll Control	4-88
Tone Demonstration Package	4-89
Tone Plan	4-90
Traffic Measurement	4-91
Trunk Circuit Descriptor Options	4-93
Trunk Descriptor Definitions	4-95
Trunk Connect	4-101
Trunk Groups	4-102
Trunk Recall Partial Inhibit	4-103

CONTENTS (CONT'D)	PAGE
Trunks - Miscellaneous Options .....	4-104
Uniform Call Distribution .....	4-105
Vacant Number Intercept .....	4-106
Variable Timers .....	4-107
Verified Account Codes .....	4-108
Verified Account Codes (DISA) .....	4-109
<b>5. STATION FEATURES .....</b>	<b>5-1</b>
Abbreviated Dial Access .....	5-2
Account Code Access .....	5-3
Broker's Call .....	5-4
Call Forwarding - Busy .....	5-5
Call Forwarding - Busy/No Answer .....	5-7
Call Forwarding - Follow Me .....	5-9
Call Forwarding - I Am Here .....	5-11
Call Forwarding - No Answer .....	5-12
Call Hold .....	5-13
Call Park .....	5-15
Call Transfer .....	5-16
Callback - Busy .....	5-17
Camp-On .....	5-18
Cannot Dial a Trunk after Flashing .....	5-20
Cannot Dial a Trunk after Flashing (If Holding or in Conference with a Trunk) .....	5-21
Clear All Features .....	5-22
Data Security .....	5-23
Dial Call Pickup .....	5-24
Directed Call Pickup .....	5-25
Direct Outward Dialing .....	5-26
Discriminating Dial Tone .....	5-27
Do Not Disturb .....	5-28
Extension Conference .....	5-29
External Call Forwarding .....	5-31
Flash Disable .....	5-33
Flash for Attendant .....	5-34
Flash on Incoming Trunk .....	5-35
Flash on Outgoing Trunk .....	5-36
Ground Button .....	5-37
Hot Line .....	5-38
Hunt Group Access .....	5-39
Inward Restriction (DID) .....	5-40
Manual Line .....	5-41
Never A Consultee .....	5-42
Never A Forwardee .....	5-43
No Dial Tone .....	5-44
Non-Busy Extension .....	5-45
Originate Only .....	5-46
Override Security .....	5-47
Paging Access .....	5-48
Priority Dial 0 .....	5-49

CONTENTS (CONT'D)	PAGE
Privacy Disable .....	5-50
Receive Only .....	5-51
Transfer/Consultation Hold/Add-On .....	5-52
Transfer Dial Tone .....	5-54
Transfer With Privacy .....	5-55
Trunk Answer From Any Station (TAFAS) Day And Night .....	5-56
Trunk Camp-On Warning Tone .....	5-58
<b>6. MAINTENANCE FEATURES .....</b>	<b>6-1</b>
Alarm LEDs .....	6-2
Alarm Status Display .....	6-3
Configuration Report .....	6-4
Copy Disk .....	6-5
Device Status Report .....	6-6
Diagnostics .....	6-7
System Logging Facility .....	6-8
Remote Maintenance Administration And Test (RMATS) Access .....	6-9
Remove From Service, Return To Service .....	6-10
Show, Set Date .....	6-11
Show, Set System Time .....	6-12
Test Line Function .....	6-13
<b>APPENDIX A</b>	
<b>GLOSSARY OF SX-200<sup>®</sup> DIGITAL TERMINOLOGY .....</b>	<b>A-1</b>
<b>APPENDIX B</b>	
<b>GENERIC 1000 AND GENERIC 1001 FEATURES .....</b>	<b>B-1</b>
<b>APPENDIX C</b>	
<b>SUMMARY OF CALL TYPES FOR CALL REROUTING .....</b>	<b>C-1</b>

LIST OF TABLES

TABLE	TITLE	PAGE
2-1	Class-Of-Service Options .....	2-2
2-2	System Options and Timers .....	2-6
2-3	Programmable Feature Access Codes .....	2-7
4-1	Trunk Hardware Options .....	4-93

## 1. INTRODUCTION

**1.01** This Section describes the features provided by the SX-200<sup>®</sup> DIGITAL Private Automatic Branch Exchange (PABX) for Generic 1000 and Generic 1001 software. The selection of features is subject to minimal constraints, allowing each system to be configured to meet the individual requirements of the customer.

**1.02** Required features can be implemented from information supplied by the customer prior to installation. Subsequent additions and/or deletions can be accommodated by local and/or remote re-programming procedures.



---

## 2. TYPES OF FEATURES

### General

- 2.01** This Part provides a description of the features provided by the SX-200<sup>®</sup> DIGITAL PABX.
- 2.02** The features provided by the system can be segregated into the following groups:
- (a) **ATTENDANT FEATURES.** The Attendant through the console has access to specific features described in Part 3 of this Section. Also see Section MITL9108-093-315-NA.
  - (b) **STATION FEATURES.** These are features which can be activated for those users having typical industry-standard telephone sets, types 500 and 2500, with either rotary dial or DTMF keypad. The Station Features are described in Part 5 of this Section.
  - (c) **SYSTEM FEATURES.** These are features which apply on a systemwide basis rather than on a peripheral level (e.g., station or Attendant level). The System Features are described in Part 4 of this Section.
  - (d) **MAINTENANCE FEATURES.** The SX-200<sup>®</sup> DIGITAL PABX has a comprehensive maintenance package. The Maintenance Features are described in Part 6 of this Section. Also see Sections MITL9108-093-353-NA and MITL9108-093-351-NA.
  - (e) **SUPERSET FEATURES.** These are features which can be activated for those users having SUPERSET 3<sup>™</sup> and SUPERSET 4<sup>™</sup> sets. The SUPERSET<sup>®</sup> Features are described in Sections MITL9108-093-106-NA, SUPERSET 3<sup>™</sup> and MITL9108-093-107-NA, SUPERSET 4<sup>™</sup>.
- 2.03** Most of the Attendant, Station, and System features are optional, and can be selected via Customer Data Entry (CDE). These optional selections can be divided into three sections:
- 1. **Class-Of-Service Options** - include Attendant feature options and station feature options (refer to Table 2-1).
  - 2. **System Options and Timers** - include the selectable system options and the variable timers (refer to Table 2-2).
  - 3. **Feature Access Codes** - are the set of features that require user access codes (refer to Table 2-3).

Features Description

**TABLE 2-1  
CLASS-OF-SERVICE OPTIONS**

<b>ATTENDANT-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
100	Attendant Bell-Off	3.04
101	Attendant O/G Restriction/Room Status Setup	3.37, 4.70
102	Attendant Display of System Alarms	3.03
103	Attendant DISA Code Setup	3.22, 4.32
104	Attendant Flexible Night Service Setup	3.35, 4.39
105	Attendant Guest Room Key	3.28
106	Attendant New Call Tone	3.14, 3.35
107	Attendant Automatic Call Forward - Don't Answer	3.13
108	RESERVED	
109	Attendant Serial Call	3.42
110	Attendant Abbreviated Dial Confidential Number Display	3.02
111	Attendant Abbreviated Dial Programming	3.02
112	Attendant Station Busy-Out	3.25, 3.43
113	Attendant Call Block Key	3.07
114	Attendant Trunk Busy-Out	3.48
115	Attendant-Timed Recall (No Answer) 10 - 60 Seconds Default is 30 Seconds	3.45, 4.74
116	Attendant-Timed Recall (Hold) 10 - 60 Seconds Default is 30 Seconds	3.45, 4.74
117	Attendant-Timed Recall (Camp-on) 10 - 60 Seconds Default is 30 Seconds	3.15, 3.45, 4.74
118	Attendant Automatic Call Forward - Don't Answer Timer 10 - 60 Seconds	3.13
119	Attendant Tone Signaling On Trunks	3.46
<b>STATION/SUPERSET®-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
200	Account Code, Forced Entry - External Calls	4.03, 5.03
201	Account Code, Forced Entry - Long Distance Calls	4.03, 5.03
202	Alarm Call	4.09
203	Broker's Call	5.04
204	Call Block Applies (Room To Room)	3.07
205	Call Distribution Agent Position	4.90
206	Call Forwarding - Busy	5.05, 5.06, 5.25
207	Call Forwarding - Don't Answer	5.06, 5.09, 5.25
208	Call Forwarding - External	5.25
209	Call Forwarding - Follow Me	5.07, 5.08, 5.25, 5.31
210	Call Forwarding Inhibit on Dial-In Trunks	4.10
211	Call Hold and Retrieve Access	5.10
212	Can Flash if Talking to an Incoming Trunk	5.04, 5.24, 5.28, 5.45, 5.47
213	Can Flash if Talking to an Outgoing Trunk	5.04, 5.24, 5.29, 5.45, 5.47
214	Cannot Dial a Trunk After Flashing	5.15, 5.24, 5.45

**TABLE 2-1 (CONT'D)  
CLASS-OF-SERVICE OPTIONS**

<b>STATION/SUPERSET<sup>®</sup>-RELATED (Cont'd)</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
215	Cannot Dial a Trunk if Holding or Conferencing with One	5.16, 5.24, 5.45
216	Data Security	5.18
217	Direct To ARS	4.33, 4.67, 4.93
218	Directed Call Pickup	5.20
219	Discriminating Dial Tone	5.22
220	Do Not Disturb	5.23
221	Clear All Features	5.17
222	RESERVED	
223	Flash Disable	5.26
224	Flash for Attendant	5.27
225	Hold Pickup (Attendant-Paged Access)	3.38
226	Inward Restriction (DID)	5.33
227	Lockout Alarm Applies	4.50
228	Manual Line	5.31, 5.34
229	Message Register Applies	3.33, 4.52
230	Message Register Overflow Alarm	4.52
231	Message Waiting Setup - Bell	4.53
232	Message Waiting Setup - Lamp	4.53
233	Never a Consultee	5.35
234	Never a Forwarder	5.36
235	Originate Only	5.39
236	Outgoing Trunk Callback	4.08, 5.13
237	Outgoing Trunk Camp-on	4.08, 5.14
238	Override Security	5.40
239	Priority Dial 0	5.42
240	Privacy Disable	5.43
241	Receive Only	5.44
242	Repeated Camp-on Beeps	5.49
243	Non-Busy Extension	5.38
244	Room Status Applies	4.70
245	Abbreviated Dialing Access	5.02, 5.25
246	TAFAS Any Access	5.48
247	TAFAS Access Tenant	5.48
248	TAFAS Access During Day Service	5.48
249	Transfer Dial Tone	5.46
250	Transfer With Privacy	5.47
251	Call Forward - Don't Answer Timer (2 - 6 Rings) Default is 3 Rings	5.05 - 5.09*
252	Call Hold Recall Timer (1 - 5 Minutes) Default is 3 Minutes	5.10, 5.11
253	Repeated Camp-on Beeps Timer (5 - 15 Seconds) Default is 10 Seconds	5.49
254	UCD Music On Hold Timer (0 - 50 Minutes)	4.90

**TABLE 2-1 (CONT'D)  
CLASS-OF-SERVICE OPTIONS**

<b>ATTENDANT/STATION/SUPERSET®-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
300	Automatic Callback	5.13
301	Camp-on	3.15, 5.14
302	Flash-in Conference (Greater than 3)	5.24, 5.45
303	Paging Zone 1 Access	3.38, 3.39, 5.41
304	Paging Zone 2 Access	3.38, 3.39, 5.41
305	Paging Zone 3 Access	3.38, 3.39, 5.41
306	Paging Zone 4 Access	3.38, 3.39, 5.41
307	Paging Zone 5 Access	3.38, 3.39, 5.41
308	Paging Zone 6 Access	3.38, 3.39, 5.41
309	Paging Zone 7 Access	3.38, 3.39, 5.41
310	Paging Zone 8 Access	3.38, 3.39, 5.41
311	Paging Zone 9 Access	3.38, 3.39, 5.41
312	Paging Default (0 Gives All Zones Enabled) (0-9)	3.38, 3.39, 5.41
313	CO Trunk To CO Trunk Connect	4.86
314	CO Trunk To Tie Trunk Connect	4.86
315	CO Trunk To DID Trunk Connect	4.86
316	Tie Trunk To Tie Trunk Connect	4.86
317	Tie Trunk To DID Trunk Connect	4.86
318	DID Trunk To DID Trunk Connect	4.86
319	Extension Non-CO Trunk To Trunk Connect	4.86
<b>STATION-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
400	Contact Monitor	4.19
401	Call Park	5.11
402	Long Loop (Off-Premise Extensions Only)	4.60
403	Trunk Recall Partial Inhibit	4.88
<b>ATTENDANT/SUPERSET®-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
500	Override	3.05, 4.75, 4.76
501	Override Announce	3.05, 3.06, 4.75, 4.76
<b>SUPERSET®-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
600	SUPERSET - Auto-Answer	4.75, 4.76
601	SUPERSET - Auto-Hold Disable	4.75, 4.76
602	SUPERSET - Background Music	4.76
603	SUPERSET - Disconnect Alarm	4.75, 4.76
604	SUPERSET - Immediate Line Select	4.75, 4.76

**TABLE 2-1 (CONT'D)  
CLASS-OF-SERVICE OPTIONS**

<b>SUPERSET®-RELATED (Cont'd)</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
605	SUPERSET - Message Program	4.76
606	SUPERSET - Sub-Attendant	4.76
607	SUPERSET - Associated Modem Line	4.05, 4.76
608	SUPERSET - Room Status Display	4.76
609	SUPERSET - Night Service Switching	4.76
<b>ALL DEVICES</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
700	SMDR - Does Not Apply	4.03, 4.73
701	No Dial Tone	5.37
702	SMDR - Overwrite Buffer	4.73
<b>TRUNK-RELATED</b>		
<b>Option Number</b>	<b>Class-of-Service Name</b>	<b>Paragraph</b>
800	ANI Applies	4.07
801	Incoming Trunk Call Rotary	4.89
802	Limited Wait For Dial Tone	4.48, 4.89
803	SMDR - Drop Calls < n Digits (0...11, disabled = 0)	4.73
804	SMDR - Drop Incomplete Outgoing Calls	4.73
805	SMDR - Extended Record	4.73
806	RESERVED	
807	SMDR - Record Incoming Calls	4.03, 4.73
808	SMDR - Record Meter Pulses	4.73
809	RESERVED	
810	Special DISA	4.32, 4.67, 4.94
811	Standard Ring Applies	4.34
812	DISA During Night Service Only	4.32

TABLE 2-2  
SYSTEM OPTIONS AND TIMERS

Option Number	System Options/System Timers	Paragraph
01	24 Hour Clock	3.19
02	RESERVED	
03	RESERVED	
04	Message Waiting & Message Register Change Print	3.33, 3.34, 4.53
05	Verified Account Codes	4.93
06	RESERVED	
07	RESERVED	
08	RESERVED	
09	Attendant Call Block	3.07
10	Attendant Conference Beeps	3.17
11	Automatic Wake-Up	4.09
12	Automatic Wake-Up Alarm	4.09
13	Automatic Wake-Up Print	4.09
14	Automatic Wake-Up Music	4.09
15	Data Demultiplexer	4.23
16	DID to Non-CO Trunk Via Attendant Inhibit	4.86
17	Discriminating Ringing	4.34
18	Discriminating Ringing Always	4.34
19	RESERVED	
20	Holiday Messages	4.76
21	Incoming to Outgoing Call Forward	5.25
22	Last Party to Clear - Dial Tone	4.47
23	Message Reg. Count Additional Supervisions	4.52
24	Message Register Audit	3.33
25	Message Register Zero After Audit	3.33
26	No Overlap Outpulsing	4.46
27	Room Status Audit	4.70
28	SMDR Indicate Long Calls	4.73
29	SUPERSET® Set Last Number Redial	3.32, 4.75, 4.76
30	RESERVED	
31	Satellite PBX	4.72
32	Outgoing Call Restriction	3.37
33	Room Status	4.70
34	Auto Room Status Conversion/Auto Wake-Up Print	4.70
35	Digit Translation Plan (0 - 3)	4.28
36	ARS Unknown Digit Length Time-out (2 - 15 Seconds)	4.08, 4.46
37	Limited Wait For Dial Tone (3 - 15 Seconds)	4.48, 4.89
38	Pseudo Answer Supervision Timer (10 - 60 Seconds)	4.85
39	Dialing Conflict Timer (2 - 10 Seconds)	4.17
40	Final Ring Time-out (1 - 30 Minutes)	4.69
41	Minimum Flash Timer (10 ms units) 20 - 50	4.38, 4.77
42	Maximum Flash Timer (10 ms units) 20 - 150	4.38, 4.77
43	DISA Answer Timer (1 - 8 Seconds)	4.32, 4.94
44	Account Code Length (VARIABLE or 4 - 12 digits)	4.03, 4.93
45	Auto Room Status Conversion/Auto Wake-Up Timer	4.70
46	Room Status Call Restriction Default	4.70

**TABLE 2-3  
PROGRAMMABLE FEATURE ACCESS CODES**

<b>Number</b>	<b>Feature Name</b>	<b>Paragraph</b>
01	Account Code Access	4.03, 5.03
02	Auto-Answer Activation	4.75
03	Call Forwarding - Busy	5.05, 5.25
04	Call Forwarding - Don't Answer	5.09, 5.25
05	Call Forwarding - Busy/Don't Answer	5.06, 5.25
06	Call Forwarding - Follow Me	5.07, 5.25
07	Call Forwarding - I'm Here	5.08, 5.25
08	Dial Call Pickup	5.19
09	Directed Call Pickup	5.20
10	Do Not Disturb	5.23
11	Extension General Attendant Access	4.26, 5.34
12	Paging Access to Default Zone(s)	5.41
13	Paging Access to Specific Zones	3.39, 5.41
14	TAFAS - Any	5.48
15	TAFAS - Local Tenant	5.48
16	Hold Pickup Access (Attendant Hold Slots)	3.39
17	Console Lockout Access Code	3.18
18	Maintenance Function (Test Line)	6.13
19	Direct Inward System Access	4.32
20	Callback Busy (Single Digit)	5.13
21	Call Hold	5.10
22	Call Hold Retrieve (Local)	5.10
23	Call Hold Retrieve (Remote)	5.10
24	Abbreviated Dial Access	3.06, 4.02, 5.02
25	Clear All Features	5.17
26	SUPERSET 4 Set Loopback Test	4.76
27	Tone Demonstration	4.82
28	RESERVED	
29	RESERVED	
30	Executive Busy Override (Single Digit)	3.05, 4.75, 4.76
31	Automatic Wake-up	4.09
32	Call Park	5.11
33	Node ID	4.59
34	Maid In Room	4.70
35	SUPERSET 4™ Set Room Status Display	4.76
36	Direct To ARS	4.33, 4.93

## Features Description

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**2.04** Each feature is described in four subparagraphs as follows:

<b>Description</b>	This subparagraph gives a brief description of the feature.
<b>Conditions</b>	The conditions and limitations of the feature are described in this subparagraph.
<b>Programming</b>	The required system programming steps are listed in this subparagraph.
<b>Operation</b>	This subparagraph describes the operations which the end user must perform to use this feature.



### 3. ATTENDANT FEATURES

**3.01** All features provided by the SX-200<sup>®</sup> DIGITAL PABX which apply to the Attendant Console are described in the following paragraphs. Attendant functions are performed by the LCD Console, which has a 4-line, 80-character Liquid Crystal Display (LCD) display, and a keyboard with an extensive range of operational key groups to perform a wide variety of different functions.

Information presented on the four lines of the LCD display includes:

- Date (if idle), or call source data, and time/call waiting indication
- Call destination data
- Softkey labels (F1-F5)
- Softkey labels (F6-F0).

When the console is used for Customer Data Entry, the CDE forms are displayed on the LCD.

More detailed information on the Attendant Console may be found in Section MITL9108-093-315-NA, Attendant Console Description.

### 3.02 ATTENDANT ABBREVIATED DIAL PROGRAMMING, ACCESS

#### Description

This feature allows the Attendant to program system abbreviated dial numbers from the Attendant Console. The Attendant has the option of making abbreviated dial numbers confidential. Optionally, the attendant can also view other Attendants' confidential abbreviated dial numbers.

#### Conditions

None

#### Programming

To allow abbreviated dial programming, select COS Option 111 (Attendant Abbreviated Dial Programming) for the console.

To allow access to confidential abbreviated dial numbers, select COS Option 110 (Attendant Abbreviated Dial Confidential Number Display) for the console.

#### Operation

To program an abbreviated dial number, press the following keys:

FUNCTION  
ATT FUNCTION  
ABB DIALING  
(enter the new access code for the external number)  
ENTER  
PRIVATE (only if this is to be a confidential number)  
(enter the external number in its entirety)  
SET  
EXIT

To view confidential abbreviated dial numbers, enter the following:

FUNCTION  
ATT FUNCTION  
ABB DIALING  
(enter the access code for the external number)  
EXIT

### 3.03 ATTENDANT ALARM READOUT

#### Description

The Attendant Console can display the alarm codes presently active in the system. The Attendant can cause a readout of the alarm messages one by one using the softkeys. The message indicates the fault and its location.

#### Conditions

For the Attendant to access the alarms, the following must be true:

- there must be no other console accessing alarms
- there must be no console or maintenance terminal accessing maintenance
- there must be no console or maintenance terminal accessing CDE
- there must be no current Test Line access.

#### Programming

Select COS Option 102 (Attendant Display of System Alarms) for the console.

#### Operation

To obtain an alarm readout, press the following keys in order:

FUNCTION  
ALARM  
MORE  
CANCEL

### 3.04 ATTENDANT BELL-OFF

#### Description

This feature enables the Attendant to mute the console ringer. Incoming calls will be indicated by a flashing Answer Key LED and LDN softkeys displayed on the console. When the console ringer is disabled, "BELL OFF" appears on the second line of the console LCD display.

#### Conditions

The system defaults this feature to "bell on" upon system power-up.

#### Programming

Select COS Option 100 (Attendant Bell-Off) for the console.

#### Operation

To disable the console ringer, enter the following softkeys:

FUNCTION  
BELL OFF

To enable the console ringer again, do the same.

### 3.05 ATTENDANT BUSY OVERRIDE

#### Description

This option allows the attendant who encounters a busy connection, to override the connection and enter the call. Before the Attendant enters the connection, all parties in the call hear an 800 ms burst of warning tone, after which the Attendant 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 overridden, reorder tone is returned, and the console LCD displays "CANT".

Optionally, the Attendant may override to a SUPERSET<sup>®</sup> Call Announce Port rather than cutting into the call.

The Attendant may program abbreviated dial numbers terminating with "\*\*5". These abbreviated dial numbers will announce over SUPERSET<sup>®</sup> Call Announce Ports. See ABBREVIATED DIAL in this Section.

#### Conditions

If a call includes an extension with either Option 216 (Data Security) or Option 238 (Override Security) in its COS, no party in the call can be overridden (the OVERRIDE softkey will not appear – see 'Operation').

Override can only be performed on an established (talking) call.

Override cannot be performed on an attempted trunk group access.

A call cannot be overridden by two parties simultaneously.

#### Programming

Select COS Option 500 (Override) for the console.

Assign an access code to Feature 30 (Executive Busy Override).

To allow the Attendant to override to SUPERSET<sup>®</sup> Call Announce Ports, select COS Option 501 (Override Announce) for the console.

#### Operation

Having reached a busy number:

Press and hold down the console OVERRIDE softkey – all parties in the connection hear the warning tone; the Attendant is connected to the call, as long as the key is depressed.

Release the OVERRIDE softkey – the Attendant is released from the call.

### 3.06 ATTENDANT CALL ANNOUNCE

#### Description

This feature allows the attendant who encounters a busy connection to a SUPERSET 4™ set to announce the call over the set's Call Announce port, without intruding into the call. The Attendant can converse with the called party through the set's speaker and microphone, while the call in progress continues through the handset.

#### Conditions

Attendant Call Announce operates only on SUPERSET 4™ sets with a call announce port wired.

No action may be taken on a Call Announce (e.g., transfer).

The Attendant Console must have COS option 501 (Override Announce) enabled.

#### Programming

The Attendant must program Abbreviated Dial numbers, terminating them with \*5, to be used to access the Call Announce ports of the required SUPERSET 4™ sets. Refer to ABBREVIATED DIAL for further details.

To allow the Attendant to override to SUPERSET 4™ set Call Announce ports, select Console COS option 501 (Override Announce).

Enter the Abbreviated Dial numbers, terminated with \*5, into CDE Form 30 (System Abbreviated Dial Entry) for those extensions whose Call Announce Port the Console is to access.

Assign an access code to Feature 24 (Abbreviated Dial Access).

#### Operation

The Console accesses the busy SUPERSET 4™ set by placing an Abbreviated Dial call to its Call Announce port, and presses the OVERRIDE softkey. The SUPERSET 4™ set is connected to the Console, and conversation takes place between the Console and the Call Announce port of the busy SUPERSET 4™ set.

### 3.07 ATTENDANT CALL BLOCK SETUP

#### Description

This feature allows the attendant to restrict extensions from making calls to other extensions by activating call blocking from the console. Calls to the attendant or to extensions without the call blocking option selected may be made normally. Attempted calls between restricted extensions may be programmed to intercept to the attendant (see Call Rerouting).

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

Select COS Option 204 (Call Block Applies) for the extension.

Select System Option 09 (Attendant Call Block).

Select COS Option 113 (Attendant Call Block Key) for the Attendant console.

#### Operation

To set up Call Blocking:

- Press the CALL BLOCK key - the CALL BLOCK lamp lights; all calls are blocked between extensions with Option 204 in their COS.

To remove Call Blocking:

- Press the CALL BLOCK key - the CALL BLOCK lamp goes out; Call Blocking is removed.

### 3.08 ATTENDANT CALLBACK – BUSY/NO ANSWER

#### Description

The Attendant can set up a callback if the called extension is busy or does not answer.

#### Conditions

A callback always rings the originating extension; call forwarding has no effect.

Callback – Busy/No Answer 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.

Internal callbacks outstanding for more than 8 hours are canceled automatically; ARS (trunk) callbacks are canceled after 1 hour.

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.

#### Programming

None

#### Operation

Having reached a busy or non-answering number:

Press the CALLBACK softkey. The console will ring after the called party goes off- and on-hook. As soon as the attendant answers the callback, the called party rings.



### 3.09 ATTENDANT CALL FORWARD SETUP AND CANCEL

#### Description

This feature allows the Attendant to set up, review and cancel call forwarding for any extension. The extension for which the Attendant sets up forwarding need not have any of the call forwarding features in its Class Of Service (COS). The Attendant may also set up call forwarding from the extension to the Attendant.

#### Conditions

The extension to which the calls are forwarded must not have Option 234 (Never a Forwardee) in its COS.

#### Programming

None

#### Operation

To set up Call Forwarding (to internal number), enter the following in sequence:

FUNCTION  
ATT FUNCTION  
STATION  
(dial the extension number)  
CALL FWD  
(enter the desired call forward destination extension number)  
ALWAYS (or NO ANSWER or ON BUSY or BUSY/NO ANS)

To set up Call Forwarding (to external number) enter the following in sequence:

FUNCTION  
ATT FUNCTION  
STATION  
(dial the extension number)  
CALL FWD  
(enter the desired call forward destination speed call number)  
ALWAYS (or NO ANSWER or ON BUSY or BUSY/NO ANS)

To review Call Forwarding for an extension:

- Press the following keys, in this sequence:

FUNCTION  
ATT FUNCTION  
STATION  
(dial the extension number)  
CALL FWD

To cancel Call Forwarding for a single extension:

## Features Description

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- Press the following keys, in this sequence:

FUNCTION  
ATT FUNCTION  
STATION  
(dial the extension number)  
CALL FWD  
CANCEL

---

### 3.10 ATTENDANT CALL SELECTION: LDN, RECALL, INTERNAL

#### Description

The Attendant Console has up to 10 call selection positions; one is for RECALL, one for Internal calls, and the remaining keys are for Listed Directory Numbers (LDN). Each LDN key can represent a different directory number for the system. LDN, Recall, and Dial 0 keys all appear as softkey features when the console is receiving an incoming call.

This feature allows the Attendant 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 ANSWER LED flashes. The Attendant may answer the first call in the console queue by pressing the ANSWER key, or may select a call of a specific type by pressing the appropriate softkey. The ANSWER LED continues to flash as long as there are calls in the queue. Ten incoming call indicators are provided, identifying the following call types:

RECALL -	recalls.
LDN 1-9 -	These keys may be assigned to call types (see CALL REROUTING) or incoming trunks. See ATTENDANT LDN KEYS and PROGRAMMABLE LDN NUMBERS for further information.
Internal -	calls directed to the console's directory number (this is one of the LDN positions).
Dial 0 -	calls directed to the console (caller dialed 0) (this is one of the LDN positions)
Priority Dial 0 -	calls directed to the console from stations whose COS option assigns them priority when they dial 0 to access the console (this is one of the LDN positions)

#### Conditions

Assignment of call types and trunks to LDN keys is arbitrary. All trunks may be on one key, or they may be distributed across any number of keys as required.

#### Programming

See PROGRAMMABLE LDN KEYS.

#### Operation

To answer the first call in the Attendant queue:

- Press the ANSWER key - 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

## Features Description

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Attendant is connected to the calling party.  
To answer a specific call type:

- Press the softkey associated with the desired call type - the tone ringer stops, the ANSWER LED lights steadily, the SOURCE display shows the number of the originating party, and the Attendant is connected to the calling party.

### 3.11 ATTENDANT CALLED AND CALLING NAME, NUMBER, COS, COR DISPLAY

#### Description

The Attendant Console will display the digits dialed from the console as they are dialed. After the digits are dialed, the name (if available – see below), Class Of Restriction (COR), and Class Of Service (COS) associated with the dialed digits will also appear on the console display.

#### Conditions

The calling or called name is displayed only if a name has previously been programmed by the SUPERSET 4™ set user.

#### Programming

None

#### Operation

None – The completion of dialing by the attendant results in the information appearing on the console LCD display. The information is displayed in the same manner when the attendant answers a calling party.

### 3.12 ATTENDANT CALL SPLITTING AND SWAPPING

#### Description

During the setting up of a call between two parties, the attendant may require to speak to both parties, or to speak privately with either of the parties. This can be accomplished by the use of the CONF, SOURCE, and DEST softkeys.

#### Conditions

None

#### Programming

None

#### Operation

Establish a 3-party conference via the CONF softkey - the attendant may now speak to both parties.

Press either the SOURCE or DEST key to split the call and talk to either party privately. The Attendant may alternate between the parties by one of the two keys, as required to select the other party.

Press the RELEASE key to disconnect the Attendant from the conference, leaving the two parties connected.

Press the CANCEL key to drop the conference, disconnecting both parties from the Attendant, and leaving the console in idle mode.

### 3.13 ATTENDANT CALLS FORWARDED ON NO ANSWER

#### Description

Incoming calls, or recalls to the Attendant which are not answered within a predetermined time-out period are routed to the NIGHT 1 routing point (if there is one).

See CALL REROUTING.

#### Conditions

None

#### Programming

Select COS Option 107 (Attendant Automatic Call Forward - No Answer) for the console.

Set the time-out period via COS Option 118 (Attendant Automatic Call Forward - No Answer Timer); the default time is 30 seconds.

Enter a NIGHT1 routing point for the appropriate call types via CDE Form 19 (Call Rerouting Table).

For Non-Dial-In Trunks, enter the required NIGHT1 answer point into CDE Form 14 (Non-Dial-In Trunks).

#### Operation

None

### 3.14 ATTENDANT CALLS WAITING DISPLAY

#### Description

The Attendant Console may have calls from outside trunks and extensions queued that are waiting to be answered. The total number of calls in the queue will be displayed in the CW (Calls Waiting) area of the display located in the top right corner of the LCD display. The console tone ringer will ring and the ANSWER LED will flash, if the console is idle and calls are in the CW queue.

#### Conditions

If there are no calls in the Calls Waiting queue, there will be nothing in the CW area of the LCD display.

#### Programming

Enable COS option 106 (Attendant New Call Tone) and the console will give a short tone each time a call is added to the CW queue.

#### Operation

See ATTENDANT CALL SELECTION and/or ATTENDANT HOLD SLOTS for operational details.

- Notes:**
1. When the console is idle, the console tone ringer will ring if calls are waiting to be answered.
  2. When the console is busy and COS option 106 is not enabled, a call is added to the CW queue but there is no tone indication at the CONSOLE.



### 3.15 ATTENDANT CAMP-ON

#### Description

This feature allows the Attendant to connect calls to a busy extension or trunk for automatic completion when the called busy party becomes free. When a call is camped on to an extension, the called extension only will hear a burst of camp-on tone indicating the existence of a camped-on call. If the camped-on call is from a trunk, two bursts of Camp-On tone are given; if from an extension, a single burst of tone is given.

#### Conditions

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.

If COS Option 301 (Camp-On) is not selected for the trunk, an attempt to camp a call onto a busy extension will result in the call being disconnected when the console RELEASE key is pressed.

Extensions with COS Option 216 (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 (with Music on Hold provided) when the camp-on is initiated, the music is removed while the camp-on tone is applied.

#### Programming

Select COS Option 301 (Camp-On) for the trunk.

Select COS Option 117 (Attendant-Timed Recall - CAMP ON) to set the time-out period (default time is 30 seconds).

#### Operation

To camp a call onto a busy number:

- Press the RELEASE key - this automatically camps on the calling party to the busy number.

**3.16 ATTENDANT CCSA ACCESS**

**Description**

The Attendant may access the Common-Controlled Switching Arrangement (CCSA) trunks. For further information, see ATTENDANT DIRECT TRUNK ACCESS, and CCSA.

**Conditions**

None

**Programming**

None

**Operation**

See ATTENDANT DIRECT TRUNK SELECT.

### 3.17 ATTENDANT CONFERENCE

#### Description

This feature allows the Attendant to enter into a conference with the destination party and the source party of a call. The Attendant may also initiate a 3-party conference call. When the Attendant is in a conference, a periodic warning beep may be heard by all parties (if the option is enabled).

#### Conditions

None

#### Programming

There is no programming required to enable Attendant Conferences.

To enable Attendant conference warning beeps, select System Option 10 (Attendant Conference Beeps).

#### Operation

To enter into a conference with the source and destination parties, press the CONF softkey.

To initiate a conference, do the following:

- Dial the first party and establish a connection.
- Dial the second party and establish a connection.
- Press the CONF softkey.
- The three parties are now in a conference.

### **3.18 ATTENDANT CONSOLE LOCKOUT**

#### **Description**

The Attendant can enter an access code to restrict the capabilities of the Attendant Console. When the console is locked out, the following restrictions take effect:

- no outgoing trunk calls can be made
- there is no Attendant function access.

The Attendant Console may still be used to initiate internal calls, and to answer incoming trunk calls.

The console may be locked out at any time by the Attendant.

#### **Conditions**

None

#### **Programming**

Assign an access code to Feature 17 (Console Lockout Access Code).

#### **Operation**

To lock out the console, enter the Console Lockout access code.

To return the console back to normal operation, re-enter the code.

### 3.19 ATTENDANT DATE AND TIME DISPLAY

#### Description

The SX-200<sup>®</sup> DIGITAL PABX continually displays the time of day on the left-hand portion of the status line of the Attendant Console LCD display. When the console is idle, the date (month, day, year) is also displayed. The displayed time is used by Message Waiting, Traffic Measurement, SMDR, SUPERSET 4<sup>™</sup> sets, and other features. The time may be displayed in 12- or 24-hour format.

#### Conditions

Some traffic measurements may be lost with a date change.

#### Programming

If 12-hour time display is required, no clock options are required.  
If 24-hour time display is required, select System Option 01 (24-Hour Clock).

#### Operation

To set Time-of-Day, enter the following in order:

FUNCTION  
ATT FUNCTION  
SET TIME  
(enter the desired time)  
SET (or PM)

To set date, enter the following in order:

FUNCTION  
ATT FUNCTION  
SET DATE  
(enter the desired date)  
SET

### **3.20 ATTENDANT DESTINATION KEY**

#### **Description**

This feature allows the Attendant to press a softkey (DEST) to speak to the destination party of a call.

The destination party's extension number, COS, and COR are displayed on the second line of the console's LCD display.

#### **Conditions**

This softkey will only appear when the Attendant Console is connected to a multi-party call.

#### **Programming**

None

#### **Operation**

Press the DEST softkey - the console is connected to the destination party.

### 3.21 ATTENDANT DIRECT TRUNK SELECT

#### Description

The console (or test line) may be used to directly access (seize) a trunk for maintenance or operational procedures.

#### Conditions

None

#### Programming

None

#### Operation

To check the current status of a trunk, enter the following softkeys:

FUNCTION  
ATT FUNCTION  
TRUNKS  
(enter the desired trunk number)  
STATUS  
EXIT

To select a trunk for Attendant access only, enter the following softkeys:

FUNCTION  
ATT FUNCTION  
TRUNKS  
(enter the desired trunk number)  
ATT ACCESS

To force-release a non-idle trunk for Attendant access, enter the following softkeys:

FUNCTION  
ATT FUNCTION  
TRUNKS  
(enter the desired trunk number)  
ATT ACCESS  
FORCE RLS

To release a trunk from Attendant access, press the RELEASE key.

### 3.22 ATTENDANT DISA CODE SETUP ENABLE

#### Description

This option allows the Attendant 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 five digits.

The DISA code cannot be displayed.

An Attendant cannot delete the DISA code; it may only be deleted via CDE Form 02 (Feature Access Codes). See Section MITL9108-093-210-NA, Customer Data Entry for further details.

#### Programming

Select COS Option 103 (Attendant DISA Code Setup) for the console.

#### Operation

To change the DISA access code, enter the following softkeys:

FUNCTION  
ATT FUNCTION  
MORE..  
DISA CODE  
(enter a new DISA access code)  
SET



---

### 3.23 ATTENDANT DISPLAY AND SETUP OF SUPERSET 4™ SET MESSAGES

#### Description

There are eight default and seven programmable SUPERSET 4™ messages for use on the SUPERSET 4™ LCD displays. The Attendant may read the currently displayed message on a specific SUPERSET® set, read all of the available messages, and set up any of the messages to be displayed on any SUPERSET 4™ set.

#### Conditions

None

#### Programming

None

#### Operation

To read all of the available messages, enter the following keys in order:

FUNCTION  
ATT FUNCTION  
STATIONS  
(enter a SUPERSET 4™ extension)  
SET UP MSG

The messages will appear at the start of the second line on the console's LCD display. All of the available messages can be read by pressing the NEXT softkey. An OFF softkey is presented for the message currently displayed (if any) on the specified SUPERSET 4™ set. All other messages will result in an ON softkey being presented.

To set up or remove a message from a SUPERSET 4™ set, enter the same keys as above in the same order, and press the ON or OFF softkey as required.

### 3.24 ATTENDANT DO NOT DISTURB (DND) SETUP AND CANCEL

#### Description

The Attendant may set up or cancel Do Not Disturb (DND) for an extension.

#### Conditions

None

#### Programming

None

#### Operation

To set up Do Not Disturb on an extension, press the following keys:

FUNCTION  
ATT FUNCTION  
STATIONS  
(enter the extension number)  
NO DISTB  
EXIT

or

FUNCTION  
GUEST ROOM  
(enter the extension/room number)  
NO DISTB  
EXIT

To cancel Do Not Disturb on an extension, press the same keys in the same order.

To set up or cancel Do Not Disturb while talking to an extension, toggle the NO DISTB softkey.

### 3.25 ATTENDANT EXTENSION BUSY-OUT

#### Description

This feature allows the Attendant to busy out any extension (the extension cannot originate or receive any calls), and to remove the busy-out condition. If the Attendant dials the number of a busied-out extension, the console will display the extension number and "BSY OUT" in the Destination display and the Attendant will receive reorder tone.

#### Conditions

If the extension is idle when the Attendant dials the busy-out code, the extension will be busied-out immediately.

If the extension is engaged when the Attendant dials the busy-out code, the extension is busied-out as soon as the extension becomes idle or Handsfree 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.

#### Programming

Select COS Option 112 (Attendant Station Busy-Out).

#### Operation

To busy out an extension press the following keys:

FUNCTION  
 ATT FUNCTION  
 STATIONS  
 (enter the extension number)  
 BUSY OUT  
 SET

To remove the Busy-Out Condition on an extension, enter the following keys:

FUNCTION  
 ATT FUNCTION  
 STATIONS  
 (enter the extension number)  
 BUSY OUT  
 CLEAR

### **3.26 ATTENDANT FLASH OVER TRUNK**

#### **Description**

The Attendant may flash on a CO trunk by pressing the FLASH key. After the flash the attendant may dial as required.

#### **Conditions**

The attendant may flash on outgoing trunks.  
The attendant may dial a maximum of 26 digits after a flash.  
The flash duration is approximately 200 ms.

#### **Programming**

None

#### **Operation**

While the attendant is connected to an outgoing trunk:

- Press the FLASH softkey.
- Dial as required.

### 3.27 ATTENDANT FUNCTION ACCESS

#### Description

By pressing the FUNCTION Attendant Console key, the Attendant may access all of the Attendant Functions. For further information, see ATTENDANT SOFTKEY FUNCTIONS and ATTENDANT CALL SELECTION.

#### Conditions

Attendant Functions are not available if the Attendant Console Lockout option is invoked.

#### Programming

None

#### Operation

Press the FUNCTION key – all of the Attendant Functions are presented on the console LCD display.

### 3.28 ATTENDANT GUEST ROOM FUNCTIONS

#### Description

This feature permits the Attendant to access, and have control over a series of Hotel/Motel features. The following features may be accessed:

- Message Register print/clear
- Set up/clear/print Automatic Wake-up
- Room status change/print.

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

Select COS Option 105 (Attendant Guest Room Key) for the Attendant Console.

See 'programming' for Message Register, Automatic Wake-up, and Room Status.

#### Operation

To operate Guest Room functions:

- Press the FUNCTION key.
- Press the GUEST ROOM softkey.
- Enter the room/extension number, or press the AUDITS softkey.
- See 'operation for Message Register, Automatic Wake-up, and Room Status features.

To access Guest Room Functions while talking to an extension:

- Press the FUNCTION key
- Press the GUEST ROOM softkey.

### 3.29 ATTENDANT HOLD SLOTS

#### Description

The Attendant may place an extension or trunk on hold in one of eight HOLD positions. There are four keys; HOLD1, HOLD2, and HOLD3 are for hold positions 1 to 3, while HOLD4 is for hold positions 4 through 8 in a first-in, first-out basis. A call hold recall time of 10 to 60 seconds may be programmed (default is 30).

#### Conditions

A HOLD key LED is on when it has a call on hold.

A loop start trunk may not be taken off a hold and released to another loop start trunk.

A handsfree station may not be taken off a hold and released to another handsfree station.

#### Programming

None

#### Operation

To put a Call on Hold at the console:

- Press the ANSWER key when call rings console.
- Press an idle HOLD key (1-4); call is put on hold at this HOLD key.

To Retrieve a Call on Hold at the console:

- If the call has been recalled by a call hold time-out, the HOLD key LED will flash.
- Press the key (flashing) to speak with the call "on hold".
- If the call is to be recalled before a time-out, the Attendant may press the HOLD key where the call is being held. By pressing the HOLD key, the call will be transferred to the SOURCE, or to the DESTINATION if there is a SOURCE already.

**Note:** If HOLD key 4 is used, the user must next press one of the softkey hold slots (HOLD slots 4 through 8) for both holding and retrieving.

### 3.30 ATTENDANT INDIVIDUAL DIRECTORY NUMBER

#### Description

Each Attendant Console has a unique directory number identifying that console.

In addition to the general attendant access number (0) used to obtain the attendant, a separate attendant directory number can be programmed. A calling party has the choice of either dialing the digit 0, or dialing a number which is dedicated to a particular attendant position (useful in the case where there is more than one attendant position).

#### Conditions

Calls to an individual directory number are not presented to other attendants (if any).

#### Programming

The directory number of the particular attendant positions must be programmed via CDE Form 07 (Console Assignments). See Section MITL9108-093-210-NA, Customer Data Entry for further details.

#### Operation

None



### 3.31 ATTENDANT INTERPOSITION CALLING AND TRANSFER

#### Description

In a multiple console environment, an Attendant can call or transfer a call to any other Attendant using the individual Attendant directory number. The call is transferred in the same method as a call to an extension.

#### Conditions

Both attendants must have their individual directory numbers programmed.

#### Programming

The directory number of the particular attendant positions must be programmed via CDE Form 07 (Console Assignments). See Section MITL9108-093-210-NA, Customer Data Entry for further details.

#### Operation

When the call has been answered, dial the number of the attendant console to which the call is to be transferred.

When the called party answers, press the CANCEL key to cancel the call and be returned to the SOURCE, or press the RELEASE key to transfer the SOURCE to the called party.

### 3.32 ATTENDANT LAST NUMBER REDIAL

#### Description

The Attendant has the option of using a single softkey to have the system redial the last external number manually dialed from the Attendant Console.

#### Conditions

None

#### Programming

Select System Option 29 (SUPERSET® Last Number Redial) for the console.

#### Operation

To redial the last external number dialed from the console, press the REDIAL softkey.

### 3.33 ATTENDANT MESSAGE REGISTER AUDIT

#### Description

This feature allows the attendant to display, print and clear the message register of a room.

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

- Select COS Option 229 (Message Register Applies) for extension(s) which require message registration.
- Select System Option 24 (Message Register Audit).
- Select System Option 25 (Message Register Zero After Audit) to reset all message registers to 0 after an audit.
- Select System Option 04 (Message Waiting and Message Register Change Print) to print an extension's message register after each change.

#### Operation

To display an extension's message register count, press the following keys/softkeys:

FUNCTION  
GUEST ROOM  
(enter the extension/room number)

To print all extensions with non-zero message registers, press the following keys/softkeys:

FUNCTION  
GUEST ROOM  
AUDITS  
MSG REGISTER

To clear an extension's message register, press the following keys/softkeys:

FUNCTION  
GUEST ROOM  
(enter the extension/room number)  
CLR REG

### 3.34 ATTENDANT MESSAGE WAITING SETUP AND CANCEL

#### Description

This feature allows the Attendant to inform extension users that there is a message waiting. The message waiting indication may take the form of a message on the display of a SUPERSET 4™ set, a continuously flashing lamp on the extension (if equipped), or the extension may be rung every 20 minutes with a distinctive ringing pattern (three cycles of 3.5 ips ringing).

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 canceled. If the message waiting indication is given by a lamp, the lamp flashes (at 60 ipm). When the user returns and calls the Attendant, the "MSW" indicator appears to indicate that there is a message waiting for that extension.

As an option, the system may be programmed to print a message on the system printer indicating each instance of a new message waiting.

#### Conditions

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 ringing the extension, the first ring starts 10 seconds after the extension becomes idle.

#### Programming

- Select System Option 04 (Message Waiting and Message Register Change Print) to print a message on the system printer whenever an extension has a new message waiting.

#### Operation

To set up Message Waiting on an extension, press the following keys:

FUNCTION  
ATT FUNCTION  
STATIONS  
(enter the extension number)  
MSG WAITING  
EXIT

or

FUNCTION  
GUEST ROOM  
(enter the extension/room number)  
MSG WAITING  
EXIT

To cancel Message Waiting on an extension, press the same keys in the same order.

### 3.35 ATTENDANT NEW CALL TONE

#### Description

The first call placed in the Attendant call waiting queue signals the Attendant with a single burst of tone. Subsequent calls do not alert the Attendant when they are added to the queue. Their presence is shown by the CW (Call Waiting) indication on the top line of the display.

#### Conditions

This feature is disabled if the attendant bell is turned off from the console.

#### Programming

Select COS Option 106 (Attendant New Call Tone) for the console.

#### Operation

None

### 3.36 ATTENDANT NIGHT/DAY SWITCHING

#### Description

The Attendant may select NIGHT1 service, NIGHT2 service or DAY service via softkeys. When the console is in a NIGHT mode, calls normally directed to the Attendant Console are routed to preselected extensions, hunt groups or common alerting devices.

#### Conditions

When NIGHT1 or NIGHT2 has been selected by an Attendant Console, the status is displayed on the right-hand side of the DST line of the display for all affected consoles.

#### Programming

Refer to Section MITL9108-093-210-NA, Customer Data Entry for programming details.

#### Operation

To switch to NIGHT1, NIGHT2, or DAY service, enter the following keys:

FUNCTION  
NIGHT1 or NIGHT2 or DAY SERVICE

### 3.37 ATTENDANT OUTGOING CALL RESTRICTION SETUP

#### Description

This feature allows the Attendant to restrict an extension from making any outgoing trunk calls, or certain types of outgoing calls. Extensions to which Room Status applies may be restricted to internal calls only, internal and local calls only, or no restriction.

#### Conditions

- System Options 32 (Outgoing Call Restriction) and 33 (Room Status) are mutually exclusive.
- This feature is not available in software Generic 1000.

#### Programming

- Select System Option 32 (Outgoing Call Restriction).
- Select COS Option 101 (Attendant O/G Restriction/Room Status Setup) for the Attendant Console.

#### Operation

To restrict an extension from making outgoing calls, press the following keys:

FUNCTION  
GUEST ROOM  
(enter the extension number)  
RESTRICT O/G

To remove the restriction, press these keys again in the same order.



### 3.38 ATTENDANT PAGE ACCESS

#### Description

The Attendant may access a paging zone or zones by use of the PAGE key on the Attendant Console. When the PAGE key is pressed, the console handset is connected directly to the zones of the paging equipment programmed for access for the console, and overrides any extension announcement in progress. The Attendant may alternately access the paging circuit by dialing the associated access code followed by a digit 0 - 9 for the zone required (0 accesses all zones).

Also see the ATTENDANT PAGED HOLD SLOT ACCESS and PAGING ACCESS features.

#### Conditions

None

#### Programming

Select one or more of the following COS Options for the console, as desired:

- 303 Paging Zone 1 Access
- 304 Paging Zone 2 Access
- 305 Paging Zone 3 Access
- 306 Paging Zone 4 Access
- 307 Paging Zone 5 Access
- 308 Paging Zone 6 Access
- 309 Paging Zone 7 Access
- 310 Paging Zone 8 Access
- 311 Paging Zone 9 Access
- 312 Paging Default (0 Gives All Zones Enabled)

#### Operation

To connect to the default paging zone, hold down the PAGE key. The connection will remain until the PAGE key is released.

To connect to a paging zone other than the default zone, dial the 'Paging Access To Specific Zones' access code, followed by the desired paging zone number (1-9).

### 3.39 ATTENDANT PAGED HOLD SLOT ACCESS

#### Description

The Attendant can put a party on hold, and page for someone to pick up the call from the attendant hold slot.

Also see the PAGING ACCESS feature.

#### Conditions

The station from which the pickup call is made must have COS Option 225 (Hold Pickup – Attendant Paged Access) in its COS.

#### Programming

Select one or more of the following COS Options for the console, as desired:

- 303 Paging Zone 1 Access
- 304 Paging Zone 2 Access
- 305 Paging Zone 3 Access
- 306 Paging Zone 4 Access
- 307 Paging Zone 5 Access
- 308 Paging Zone 6 Access
- 309 Paging Zone 7 Access
- 310 Paging Zone 8 Access
- 311 Paging Zone 9 Access
- 312 Paging Default (0 Gives All Zones Enabled)

Assign an access code to Feature 16 (Hold Pickup Access – Attendant Hold Slots).

Assign an access code to Feature 13 (Paging Access to Specific Zones).

#### Operation

If paging the default paging zone:

- Put the calling party on hold using one of the console HOLD slots.
- Press the PAGE key – the console will display a 3- to 7-digit number followed by the letter "n".
- Page the second party, specifying the displayed number (the last number being the number of the hold slot).
- When the second party calls the displayed number, the two parties will be connected, and the console will be freed.

- If the paged party does not call, the held party will recall the Attendant automatically.

If paging a zone other than the default zone:

- Put the calling party on hold using one of the console HOLD slots.
- Dial the 'Paging Access To Specific Zones' access code, followed by the desired zone.
- Ask the paged party to call the attendant.
- When the paged party calls the Attendant and retrieves the held party, press the RELEASE key, and the console will be freed.
- If the paged party does not call, the held party will recall the Attendant automatically.

### **3.40 ATTENDANT LDN KEYS**

#### **Description**

Each Attendant has a set of nine Listed Directory Number (LDN) positions. Any or all LDN keys and labels may be programmed to appear.

#### **Conditions**

A console's LDN positions are unique; each console must have its LDN keys explicitly programmed.

#### **Programming**

The LDN keys are programmed in CDE Form 08 (Attendant LDN Assignments). See PROGRAMMABLE LDN POSITIONS for further details.

#### **Operation**

The Attendant may selectively answer any incoming call type by pressing the appropriate LDN softkey.

### 3.41 ATTENDANT RINGER VOLUME CONTROL

#### Description

There are two keys on the console, one to increase ringer volume, and one to decrease ringer volume, in a discrete step for each key depression.

#### Conditions

None

#### Programming

None

#### Operation

While the console ringer is ringing, press one ringer volume key to either increase or decrease the volume to the desired level.

### 3.42 ATTENDANT SERIAL CALL

#### Description

An incoming trunk call can be set, before being transferred by the Attendant, to recall to the Attendant either after the called party goes on-hook or if the call is not answered within the programmed time-out period.

#### Conditions

Attendant Serial Call is available on all trunk calls.

#### Programming

Select COS Option 109 (Attendant Serial Call) for the console.

#### Operation

To establish a Serial Call:

- Answer an incoming trunk call.
- Press the SERIAL CALL key.
- Dial the required destination extension number.
- Press the RELEASE key.

To answer a Serial Recall:

- ANSWER lamp flashes and RECALL softkey appears.
- Press the ANSWER key – ANSWER lamp is lit; RECALL, SOURCE, and SERIAL CALL are displayed on console.
- The Attendant is connected to the recalling trunk.

To cancel a Serial Recall:

- ANSWER lamp flashes and RECALL softkey appears.
- Press the ANSWER key – ANSWER lamp is lit; RECALL, SOURCE, and SERIAL CALL are displayed on the console.
- Press the SERIAL CALL key and the RELEASE key; SERIAL CALL goes out and the call is cleared.

### 3.43 ATTENDANT SOFTKEY FUNCTIONS

#### Description

The console softkeys have different functions depending upon which operating mode the console is in at the given time. The current function of each softkey is displayed on the lower two rows of the console LCD. The softkey indicators F1 through F0 correspond directly to the function keys F1 through F10.

#### Conditions

Some softkeys appear only if a corresponding feature is enabled; for example, the station BUSY OUT softkey will appear only if COS Option 112 (Attendant Station Busy-Out) is enabled.

#### Programming

Refer to the specific Attendant Features.

#### Operation

Press the function key (F1 - F10) which corresponds to the desired softkey function as shown on the LCD display.

### **3.44 ATTENDANT SOURCE KEY**

#### **Description**

This feature allows the Attendant to press a softkey (SOURCE) to speak to the source party of a call.

The source party's extension number, COS, and COR are displayed on the first line of the console's LCD display.

#### **Conditions**

This softkey will only appear when the Attendant Console is connected to a multi-party call.

#### **Programming**

None

#### **Operation**

Press the SOURCE softkey - the console is connected to the source party.



### 3.45 ATTENDANT-TIMED RECALL

#### Description

This feature automatically alerts the Attendant 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 include:

Attendant-Timed Recall - Camp-On - 10 to 60 s  
Attendant-Timed Recall - No Answer - 10 to 60 s  
Attendant-Timed Recall - Hold - 10 to 60 s.

#### Conditions

Recalls to the console are inoperative during night service, unless the console is the night answer point.

#### Programming

Select COS Options 115 (Attendant-Timed Recall - NO ANSWER), 116 (Attendant-Timed Recall - HOLD), and 117 (Attendant-Timed Recall - CAMP ON), for the console to set the desired recall times.

#### Operation

None

### 3.46 ATTENDANT TONE SIGNALING

#### Description

To minimize demand on the system tone generator, the SX-200® Attendant Console normally does not transmit DTMF tones. Some applications do, however require the attendant to transmit tone on a trunk (e.g., voice mail, etc.). This feature allows the console to transmit DTMF tones during a trunk call.

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

Select COS Option 119 (Attendant Tone Signaling On Trunks) for the Attendant Console.

#### Operation

- During a trunk call, press the TONES ON key
- Send DTMF tones
- Press TONES OFF key to terminate DTMF Signaling.

### **3.47 ATTENDANT TRAINING JACKS**

#### **Description**

Training jacks are provided on the Attendant Console for use by a Supervisor or Trainer who is training a new attendant. Each console is equipped with two Attendant jacks; either jack may be used by the Attendant, while the other provides a monitoring, Supervisor, or training function. Most commonly used handsets or headsets may be used with the Attendant Console.

#### **Conditions**

Removal of both headsets and/or handsets does not automatically switch the console into Night Service.

#### **Programming**

None

#### **Operation**

Console operation does not change in any way.

### 3.48 ATTENDANT TRUNK BUSY-OUT ENABLE

#### Description

The Attendant may busy out a trunk 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 Attendant 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 camp on or initiate Callback - Busy. The call will be completed when the busy-out condition is cleared.

#### Programming

Select COS Option 114 (Attendant Trunk Busy-Out) for the console.

#### Operation

To busy out a Trunk, enter the following keys:

FUNCTION  
ATT FUNCTION  
TRUNKS  
(enter the Trunk number)  
BUSY OUT  
SET

To return Trunk to service, enter the following keys:

FUNCTION  
ATT FUNCTION  
TRUNKS  
(enter the Trunk number)  
BUSY OUT  
CLEAR

### 3.49 ATTENDANT TRUNK GROUP STATUS DISPLAY

#### Description

This feature allows the Attendant to display the status of the trunk groups. If this feature is activated while the console is idle, the display is refreshed every 5 seconds to allow a constant up-to-date monitoring of the trunk groups.

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

None

#### Operation

To obtain a trunk group status report, press the following keys:

TRUNK STAT  
MORE or EXIT

### 3.50 FRENCH LANGUAGE CONSOLE DISPLAY

#### Description

This feature allows the Attendant to change the display of Attendant Console softkeys from English to French.

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

None

#### Operation

To change from English to French, press the following keys:

FUNCTION  
FRANCAIS

To change from French to English, press the following keys:

FUNCTION  
ENGLISH

#### 4. SYSTEM FEATURES

4.01 This Part describes the system features which apply to all extension users.

### 4.02 ABBREVIATED DIAL

#### Description

This SX-200<sup>®</sup> feature allows the extension user to dial an abbreviated number (two to eight digits) in place of a longer external number (which can be up to 26 digits in length). The Attendant or CDE programmer may program or view system abbreviated dial numbers. Up to 1000 numbers may be programmed as abbreviated dial numbers, with systemwide access.

#### Conditions

Extensions must have Option COS 245 (Abbreviated Dialing Access) in their COS to access abbreviated dial numbers.

#### Programming

- Enter the abbreviated dial numbers into CDE Form 30 (System Abbreviated Dial Entry) as required.
- Assign an access code to Feature 24 (Abbreviated Dial Access).

See ABBREVIATED DIAL ACCESS.

#### Operation

See ABBREVIATED DIAL ACCESS.



---

### 4.03 ACCOUNT CODES

#### Description

Account codes are typically used to charge the cost of calls either to internal departmental cost centers or to project accounts for billing to specific projects.

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 (the default value is six digits) and will appear as an integral part of all SMDR records.

#### Conditions

If the Account Code is of the 'Variable Length' type, the account code digits must be followed by a "#" (see ACCOUNT CODE ACCESS), excepting for the case where the digit length is 12.

Rotary-dial type telephones will always have a digit length of six, as they cannot dial the # character.

#### Programming

Select the account code length as required via System Option 44 (Account Code Length - VARIABLE or 4 - 12).

Assign an Access Code to Feature 01 (Account Code Access).

For extensions that are to be forced to use account codes, select one of the following COS Options:

- 200 (Account Code, Forced Entry - External Calls)
- 201 (Account Code, Forced Entry - Long Distance Calls)
- COS Option 700 (SMDR Does Not Apply) must be disabled in the extension's COS before the extension may use account codes.
- COS Option 807 (SMDR - Record Incoming Calls) must be enabled in a trunk's COS to permit account codes to be used on incoming calls to a SUPERSET<sup>®</sup> set.

Select all of required SMDR options as outlined in Section MITL9108-093-451-NA, Station Message Detail Recording.

#### Operation

See ACCOUNT CODE ACCESS.

#### 4.04 ALARM INDICATION

##### Description

There are four alarm levels: NO ALARM, MINOR, MAJOR and CRITICAL. Minor alarms indicate problems affecting the system in a small proportion. Major Alarms indicate problems causing a serious systemwide degradation of service. Critical alarms indicate problems of such severity that they warrant automatic activation of System Fail Transfer.

Alarm status is indicated on the upper right corner of the maintenance terminal, and on the top line of the attendant console LCD display.

Refer to Section MITL9108-093-353-NA, General Maintenance Information for a complete description of alarms.

##### Conditions

None

##### Programming

None

##### Operation

None

## 4.05 ASSOCIATED MODEM LINE

### Description

This feature provides integrated voice and data for the SX-200<sup>®</sup> DIGITAL PABX. The operation involves the association of a SUPERSET 4<sup>™</sup> set and a standard ONS voice port connected to a personal computer/modem arrangement. Voice only calls are permitted, as are data only calls, simultaneous voice/data calls, and alternating voice/data calls.

### Conditions

This feature is not available in software Generic 1000.

### Programming

- Select COS Option 607 (Associated Modem Line) for the SUPERSET<sup>®</sup> set.
- An ONS card must be programmed and installed in the slot immediately preceding the SUPERSET<sup>®</sup> card.

### Operation

Voice Calls - Voice calls are handled in the normal fashion.

Data Calls - The personal computer and intelligent modem alone are involved in the placing of data calls. If a '#' character is the last digit dialed, the SUPERSET<sup>®</sup> set is connected to the called party, and the modem is disconnected.

Simultaneous  
Voice and

Data Calls - Separate voice and data calls must be initiated. In this case, there is no interaction between the SUPERSET<sup>®</sup> set and the data port.

Alternating  
Voice and

Data Calls - When a call is established with a SUPERSET 4<sup>™</sup> set via a trunk, a new SWAP key is presented, enabling the user to alternate between voice and data.

**4.06 AUTOMATIC DIAGNOSTICS**

**Description**

All errors occurring on the system will be logged automatically and can be read on demand. See DIAGNOSTICS maintenance feature.

**Conditions**

None

**Programming**

None

**Operation**

See Section MITL9108-093-353-NA, General Maintenance Information.

#### 4.07 AUTOMATIC NUMBER IDENTIFICATION (ANI)

##### Description

This feature is a mechanism that allows the DPABX to identify an incoming calling party (on a rotary E&M Tie trunk). The identifying information consists of the calling party's extension number (in rotary digits) which is outputted on the trunk, after the PABX has successfully dialed a number, external to the PABX, on that trunk.

##### Conditions

The SX-200<sup>®</sup> DIGITAL PABX and the far-end PBX must be connected by a rotary E&M Tie trunk, since the digits are outputted on the M lead.

The far-end must provide answer supervision, and be capable of handling the ANI protocol.

##### Programming

Select COS Option 800 (ANI Applies) for any trunk that is to use the ANI facility.

##### Operation

When a call is dialed on a PABX, a tie trunk will be seized and after the normal signaling (wink start, etc.), the called number will be outputted exactly as in a normal tie trunk call. The PABX will then wait for an answer supervision on the E&M tie trunk as a signal to output the calling party's extension number. During outputting of the calling extension number, the calling party will not be connected to the speech path. This will inhibit putting any noise (that could be mistaken for DTMF signaling) onto the line until all dialing is finished. Once the extension number has been outputted, the calling party's audio will be cut through and no further signaling will occur. When using ANI, the calling party is cut through later than normal, after an answer supervision has been received. This duration is normally short enough that the calling party will not notice the time until audio connection (worse case, a 5-digit extension number - 00000, would take approximately 5 seconds to be outputted after answer supervision has been received).

### 4.08 AUTOMATIC ROUTE SELECTION (ARS) ACCESS

#### Description

The SX-200<sup>®</sup> Automatic Route Selection (ARS) feature package combines the concepts of standard ARS (selecting optimum call routes, inserting/deleting routing digits) and Toll Control (allowing/disallowing specific extensions the ability to make specific types of external/long distance calls).

Also provided are: a universal numbering plan capability, six time-of-day zones, three day zones for week days, and overlap outpulsing. See Section MITL9108-093-220-NA, Automatic Route Selection for further details.

#### Conditions

See Section MITL9108-093-220-NA, Automatic Route Selection.

#### Programming

Assign a COR (Class Of Restriction) to each extension and dial-in trunk via CDE Forms 09 (Stations/SUPERSET<sup>®</sup> Sets) and 15 (Dial-In Trunks).

Assign ARS access to the COR groups via the ARS CDE forms (Forms 20 through 26). See Sections MITL9108-093-220-NA, Automatic Route Selection and MITL9108-093-210-NA, Customer Data Entry for details.

Set an unknown digit length time-out period via System Option 36 (ARS Unknown Digit Length Time-out); the default time is 5 seconds.

If callbacks are to be permitted on outgoing trunks, select COS Option 236 (Outgoing Trunk Callback) as required.

If camp-on is to be permitted on outgoing trunks, select COS Option 237 (Outgoing Trunk Camp-on) as required.

#### Operation

Dial ARS access code, usually 9; then dial external directory number.

---

## 4.09 AUTOMATIC WAKE-UP

### Description

This feature allows either the Attendant 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, repeated), music, or a recorded announcement. If the call is not answered within six rings, or if the extension is busy, an attempt is made to ring the extension two more times, at 5 minute intervals. A minor alarm may be raised if the third wake-up call is not answered, or is still busy. The system may be programmed to print a message whenever a wake-up call is set up, cancelled, or answered.

### Conditions

- An extension with "Do Not Disturb" will be overridden and rung at the designated time.
- In the event of a power failure, all expired wake-ups will be honoured within 5 minutes of a system reset.
- This feature is not available in software Generic 1000.

### Programming

Select System Option 11 (Automatic Wake-Up Enable).

Assign an Access Code to Feature 31 (Automatic Wake-up).

Select COS Option 202 (Alarm Call) for all extensions which are to access Automatic Wake-up.

Select System Option 12 (Automatic Wake-Up Alarm) to allow a minor alarm to be raised at the attendant console in the event that a wake-up call is not answered within three attempts.

Select System Option 13 (Automatic Wake-Up Print) to allow a message to be printed on the system printer whenever a wake-up call is set up, cancelled, or answered.

Select System Option 14 (Automatic Wake-Up Music) to allow music to be heard by an extension upon answering a wake-up call (see Music On Hold).

If the wake-up call is to be a recorded message, enter the extension number(s) of the ONS port(s) to which the recording device(s) are connected, into a hunt group in CDE Form 17 (Hunt Groups).

While still in Form 17, press the "GROUP TYPE" softkey, followed by the "RECORDING" softkey.

Enter the extension of the Recording Device hunt group into CDE Form 19 - Call Rerouting Table (Automatic Wake-up Routing).

**Operation**

To set up a wake-up from the Attendant Console, press the following keys:

GUEST ROOM  
(enter the extension number)  
SET WAKE-UP  
(enter the wake-up time)  
SET or PM

To cancel a wake-up from the Attendant Console, press the following keys:

GUEST ROOM  
(enter the extension number)  
CLR WAKE-UP

To set up a wake-up from the extension, dial the Automatic Wake-Up access code, followed by the desired wake-up time, in 24 hour format. At this point, dial tone is heard, indicating that the wake-up is set.

To cancel a wake-up from the extension, dial the Automatic Wake-Up access code, followed by four 9's. Dial tone is then heard, indicating that the wake-up has been cancelled.



**4.10 CALL FORWARDING - BUSY, BUSY/NO 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 call rerouting point. See CALL REROUTING for further information.

**Conditions**

Extension call forwarding takes precedence over system call forwarding; extension call forwarding is tested initially, and the call is forwarded if required, then system call forwarding is tested.

The call rerouting point cannot be an LDN access code.

**Programming**

Enter the desired call forward routing points via CDE Form 19 (Call Rerouting Table).

To disable Call Forwarding for Dial-In trunks, select COS Option 210 (Call Forwarding Inhibit on Dial-In Trunks) for the required extension(s).

**Operation**

None

## 4.11 CALL REROUTING

### Description

This feature provides flexibility for the routing of incoming calls and attendant access. Different types of calls can be routed to different answering points according to Day, Night1, and Night2 service. A call type can be routed to any extension or to any attendant console LDN position. See Appendix C for a summary of call types.

### Conditions

All call rerouting is done via CDE; see Section MITL9108-093-210-NA, Customer Data Entry for further details.

LDN access codes are not valid rerouting points for the following:

- DID forward on busy/no answer
- Dial-in Tie forward on busy/no answer
- Non-dial-in trunks alternate recall points.

### Programming

Call rerouting is performed in CDE Form 19 (Call Rerouting Table). Enter a valid extension number or LDN access code in one of the DAY, N1 or N2 service columns as desired.

### Operation

None

#### 4.12 CLASS OF RESTRICTION (COR)

##### Description

Twenty-Five Class Of Restriction (COR) groups are available in the system to provide 25 different levels of outgoing call capabilities. Each extension, SUPERSET<sup>®</sup> set, or console is assigned a COR which defines the outgoing call capabilities for that device. Dial-In Trunks are also assigned COR's. All devices with the same COR have access to the same capabilities.

All extensions belong to COR group 1 in the default database.

##### Conditions

A maximum of 25 independent CORs are available.

One COR may be assigned per extension.

##### Programming

Assign a COR number to each extension, SUPERSET<sup>®</sup> Set, Dial-In Trunk and console via CDE Forms 09 (Stations/SUPERSET<sup>®</sup> Sets), 07 (Console Assignments) and 15 (Dial-In Trunks).

##### Operation

None

#### 4.13 CLASS OF SERVICE (COS)

##### Description

Fifty Class Of Service (COS) groups are available in the system to provide 50 different levels of Station Feature accessibility. Each extension, trunk, SUPERSET<sup>®</sup> set, or console is assigned a COS which defines the Station Features available for that device. All devices with the same COS have access to the same Features.

All extensions belong to COS group 1 in the default database.

##### Conditions

A maximum of 50 independent COS are available.

One COS may be assigned per extension.

Several COS options are mutually exclusive.

##### Programming

Assign the desired features to each COS via CDE Form 03.

Assign the required access codes to Features via CDE Form 02.

Assign a COS to each extension, Dial-In Trunk and DISA Trunk via CDE Forms 09 and 15.

##### Operation

None

#### 4.14 CO (LS/GS) TRUNK SUPPORT

##### Description

CO (LS/GS) trunks are supported with the CO Trunk card (in the analog Peripheral bays) and the LS/GS Trunk card (in the digital bays) in the SX-200<sup>®</sup> DIGITAL PABX.

##### Conditions

None

##### Programming

Enter the trunk into the system's physical configuration table via CDE Form 01 (System Configuration).

Select options for the CO trunk type via CDE Form 13 (Trunk Circuit Descriptors).

Select options for the specific trunk circuits via CDE Form 14 (Non-Dial-In Trunks) for incoming calls.

See Section MITL9108-093-213-NA, Automatic Route Selection for the selection of options for outgoing calls.

See Section MITL9108-093-210-NA, Customer Data Entry for further details.

##### Operation

None

#### 4.15 COMMON-CONTROLLED SWITCHING ARRANGEMENT (CCSA) TRUNK SUPPORT

##### Description

This feature allows CCSA Trunks to be used in the SX-200<sup>®</sup> DIGITAL PABX. 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 both-way trunks.

##### Conditions

If the CCSA trunk sends less digits than expected, the trunk will receive reorder tone.

Extra digits are ignored.

CCSA trunks may access extensions, hunt groups, or the Attendant.

Incoming CCSA trunks are rotary dial only.

An extension with COS Option 226 (Inward Restriction - DID) in its COS cannot receive a call directly from a CCSA trunk.

CCSA trunks may not be externally forwarded.

##### Programming

Enter the trunk into the system's physical configuration table via CDE Form 01 (System Configuration).

Select options for the DID trunk type via CDE Form 13 (Trunk Circuit Descriptors).

Select Options for the specific trunk circuits via CDE Form 15 (Dial-In Trunks).

See Section MITL9108-093-210-NA, Customer Data Entry for further details.

See Section MITL9108-093-213-NA, Automatic Route Selection for the selection of options for outgoing calls.

##### Operation

None

## 4.16 CONFERENCING

### Description

The SX-200<sup>®</sup> DIGITAL PABX supports conference calls of up to five parties in size.

### Conditions

To initiate a conference call, the extension user must have the appropriate Class of Service. See EXTENSION CONFERENCE.

A maximum of six conferences may take place at one time; the maximum number of conferees permitted at one time is 18.

### Programming

See EXTENSION CONFERENCE.

### Operation

See EXTENSION CONFERENCE.

## 4.17 CONFLICT DIALING

### Description

The system can differentiate between conflicting extension numbers such as "52345" and "5234". This implies that extensions can be programmed as 1-, 2-, 3-, 4- or 5-digit numbers with the first digits being identical. The system will select, for example, the 4-digit extension if the fifth digit is not dialed within a preselected time.

It is recommended that extensions should not conflict with ARS leading digits or feature access codes.

### Conditions

Any feature access code which conflicts with an extension number or another access code and requires additional digits to be dialed, requires special procedures. The caller must pause for a period greater than the Dialing Conflict Timer (see below) between dialing the access code and dialing the subsequent digits.

### Programming

Select an appropriate time-out period for System Option 39 (Dialing Conflict Timer 2-10 s).

### Operation

None



#### 4.18 CONSOLELESS OPERATION

##### Description

The system may be operated without the use of an Attendant Console. Under these conditions all features associated with the console are not available. SUPERSET<sup>®</sup> sets may be used as 'sub-attendant' stations. These may switch the system between 'DAY' and 'NIGHT 1' service.

##### Conditions

Attendant features are not available at sub-attendant positions.

##### Programming

All incoming trunks must have a NIGHT1 assignment to a night bell, extension or hunt group.

##### Operation

None

#### 4.19 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 Attendant as a Dial 0 call. An extension may be programmed as a Contact Monitor.

##### Conditions

COS Options 400 (Contact Monitor) and 241 (Receive Only) are mutually exclusive.

The contact signal is nonlatching; i.e., if the contact opens, the Dial 0 call will disappear from the Attendant Console.

##### Programming

Select COS Option 400 (Contact Monitor) for the extension.

##### Operation

None

## 4.20 CUSTOMER DATA ENTRY (CDE)

### Description

Customer Data is entered from a terminal via the RS-232 connector on the Maintenance panel or the rear of the Universal Control cabinet or from an Attendant Console. Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for additional information.

### Conditions

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for additional information.

### Programming

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for programming information.

### Operation

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for user information.

#### **4.21 CUSTOMER DATA ENTRY (CDE) BACKUP AND RESTORE**

##### **Description**

This feature allows Customer Data to be dumped onto a second floppy disk, and also allows new generic software to be loaded into the system from disk. Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for additional information.

##### **Conditions**

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for additional information.

##### **Programming**

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for programming information.

##### **Operation**

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for user information.

## 4.22 CUSTOMER DATA PRINT

### Description

This feature provides a means of displaying the current state of programming of the SX-200<sup>®</sup> DIGITAL PABX. All of the CDE forms may be printed, one at a time, in a presentable format.

### Conditions

The printer must have the following characteristics:

- A line of 80 characters (minimum).
- Carriage return.
- Line feed.
- RS-232 Interface.

The following parameters are variable:

- Number of data bits, stop bits.
- Parity odd/even.
- Baud rate.

This feature is not available in software Generic 1000.

### Programming

None

### Operation

To print a CDE form:

- Log into the CDE/Maintenance terminal.
- Enter Form 31 (CDE Data Print).
- Move cursor via arrow keys to select CDE Form.
- Press the PRINT softkey.

#### 4.23 DATA DEMULTIPLEXER

##### Description

The Mitel Data Demultiplexer used with SX-100<sup>®</sup>/SX-200<sup>®</sup> PABX systems may be used with the SX-200<sup>®</sup> DIGITAL PABX. The system will provide digit identifiers in order to route the RS-232 output to various storage devices. Refer to Section MITL9160-080-300-NA, Data Demultiplexer, for additional information.

##### Conditions

Refer to Section MITL9160-080-300-NA, Data Demultiplexer, for additional information.

##### Programming

Select System Option 15 (Data Demultiplexer).

Refer to Section MITL9160-080-300-NA, Data Demultiplexer, for further programming information.

##### Operation

Refer to Section MITL9160-080-300-NA, Data Demultiplexer, for additional information.

#### 4.24 DEFAULT CUSTOMER DATA

##### **Description**

The system is preprogrammed with default, Class-Of-Service Options, and Class-Of-Restriction Options; if no alternates are programmed, the system will default to the preprogrammed data. The Feature Access Codes can be entered in Customer Data Entry (CDE).

##### **Conditions**

Refer to Section MITL9108-093-210-NA, Customer Data Entry (CDE) for additional information.

##### **Programming**

None

##### **Operation**

None

## 4.25 DEVICE INTERCONNECTION

### Description

This feature provides a means of disallowing connection between device types. This is intended to provide a method of meeting interconnection regulations imposed by various countries.

### Conditions

- The device interconnection rules imposed by the device interconnection table may be overridden by the trunk connect COS options (see 'Trunk Connect').

### Programming

Set the interconnection rules as required, using the ALLOW/DISALLOW softkey, in CDE Form 29 (Device Interconnection Table).

The device types in CDE Form 29 correspond to the following numbers:

01 - Station / set  
02 - Console  
03 - Loop Start Trunk  
04 - Ground Start Trunk  
05 - DID/Tie Trunk  
06 - 2-wire E&M  
07 - 4-wire Unamplified E&M  
08 - 4-wire Amplified E&M  
09-25 - RESERVED

### Operation

None



## 4.26 DIAL ACCESS TO THE ATTENDANT

### Description

An extension may access the Attendant by dialing a code (usually 0).

### Conditions

The Attendant Access Code may not conflict with any other access code.

### Programming

Assign an access code to Feature 11 (Extension General Attendant Access).

### Operation

To dial the attendant:

- Dial Attendant Access Code.
- Ringback tone returned.
- Attendant Console rung.

## 4.27 DICTATION TRUNKS

### Description

This system option provides for any rotary dial digits to be transmitted out on a trunk at any time during a call.

### Conditions

Dictation trunks that require tone-to-pulse conversion must have the "Dictation Trunk" trunk descriptor option enabled. Note that doing so will cause a DTMF receiver circuit to be used for the duration of the call. This is also true for trunks that require pulse-to-pulse conversion.

If the dictation trunk can receive DTMF signals, the "Dictation Trunk" trunk descriptor option will not be required, and the DTMF receiver circuit will not be tied up for the duration of the call.

### Programming

Set the switches on the analog CO trunks cards to the appropriate setting; see Section MITL9108-093-200-NA, Shipping, Receiving, and Installation for details.

Select appropriate options for the digital LS/GS trunks via CDE Form 13 (Trunk Circuit Descriptors); see TRUNK CIRCUIT DESCRIPTORS in this Section and Section MITL9108-093-210-NA, Customer Data Entry for details.

### Operation

None

## 4.28 DIGIT TRANSLATION

### Description

The SX-200<sup>®</sup> DIGITAL PABX may be programmed to provide one of four Digit Translation Plans for rotary telephone sets.

Digit Translation Plan 0 provides the following translations:

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

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.

## Features Description

---

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 the desired translation plan via System Option 35 (Digit Translation Plan 0-3).

### Operation

None

## 4.29 DIRECT INWARD DIAL (DID) TRUNK SUPPORT

### Description

This feature allows DID Trunks to be used in the SX-200<sup>®</sup> DIGITAL PABX. DID trunks allow incoming trunk calls (DID) to reach extensions directly, without Attendant intervention or assistance. 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 DPABX system after the interdigit time-out (15 s).

DID trunks may access extensions, Hunt Groups or the Attendant, but not handsfree stations.

An extension with Option 226 (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 may be programmed for Night Service assignments.

Calls attempted using vacant or illegal numbers can be routed to answering points for completion (see ILLEGAL NUMBER INTERCEPT and VACANT NUMBER INTERCEPT).

Busy or unanswered calls can be routed to answering points for completion (see CALL REROUTING for details).

DID trunks will override extensions that have the Do Not Disturb enabled.

### Programming

Enter the trunk into the system's physical configuration table via CDE Form 01 (System Configuration).

Select options for the DID trunk type via CDE Form 13 (Trunk Circuit Descriptors).

Select options for the specific trunk circuits via CDE Form 15 (Dial-In Trunks).

If DID trunks are not to be connected to Non-CO trunks via the Attendant, station or SUPERSET<sup>®</sup> set, the device interconnection rules as required in CDE Form 29 (Device Interconnection Table).

See Section MITL9108-093-210-NA, Customer Data Entry for further details.

**Features Description**

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**Operation**

None

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### 4.30 DID INTERCEPT TO RECORDED ANNOUNCEMENT

#### Description

Incoming DID trunk calls can be intercepted to groups of recording devices after dialing vacant numbers, reaching busy extensions, obtaining no answer, etc.

#### Conditions

- ONS ports, to which the recording devices are connected must be defined in CDE before being entered into a recording group.
- This feature is not available in software Generic 1000.

#### Programming

- Enter the extension numbers of the ONS ports to which the recording devices are connected, into a hunt group in CDE Form 17 (Hunt Groups).
- Press the "GROUP TYPE" softkey, followed by the "RECORDING" softkey – refer to Section MITL9108-093-210-NA Customer Data Entry for further information.
- Assign an access code to the hunt group via the "ACCESS CODE" softkey.
- Enter the extension of the recording device hunt group into CDE Form 19 (Call Rerouting Table), under one or more of the following:
  - DID Recall Point On Busy
  - DID Recall Point On No Answer
  - DID Intercept Routing For Calls Into This Tenant
  - DID Vacant Number Routing For This Tenant
  - DID Attendant Access Night Points
  - DID Routing for Calls into This Tenant
  - Dial-In Tie Recall Point On Busy
  - Dial-In Tie Recall Point On No Answer
  - Dial-In Tie Intercept For Calls Into This Tenant
  - Dial-In Tie Vacant Number Routing For This Tenant
  - Dial-In Tie Attendant Access Night Points
  - Dial-In Tie Routing for Calls into This Tenant

#### Operation

None

### 4.31 DIRECT-IN LINES (DIL)

#### Description

This feature allows CO trunks to reach specific answering points – Attendant supervision is not required. Incoming calls from the trunk ring the answering point directly – they need not appear at the Attendant Console. An answering point may be one of the following:

- an extension number
- a hunt group access code
- an Attendant console LDN position access code
- a night bell access code.

If the assigned answering point 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. Camp-on tone will be heard by an extension which is camped on to. If a Hunt Group is camped on to, the master (first) member will receive the camp-on tone. All Call Forwarding features may be activated on incoming trunk calls to extensions.

#### Conditions

Camp-On Recall and No Answer Recall to the Attendant 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 Attendant as the result of a transfer, it will then recall to the Attendant in Day or Night Service.

The trunk type must be a CO Trunk or Non-Dial-In Tie Trunk.

#### Programming

See 'Programming' for System Feature CO (LS/GS) TRUNK SUPPORT.

Enter CDE Form 14 (Non-Dial-In Trunks) – enter the desired answering points for each of the Day, Night1 and Night2 modes of operation.

#### Operation

None



## 4.32 DIRECT INWARD SYSTEM ACCESS (DISA)

### Description

This feature allows an external caller to access the 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 those which require a switchhook flash.

Optionally, the external caller can be forced to enter a special account code rather than the standard DISA access code.

### Conditions

The outside caller must use a DTMF telephone.

The security code may be one to five 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

Enter a CO trunk into the system's physical configuration table via CDE Form 01 (System Configuration).

Select options for the DISA trunk type via CDE Form 13 (Trunk Circuit Descriptors).

Select options for the specific DISA trunk via CDE Form 15 (Dial-In Trunks).

Assign a DISA security code to Feature 19 (Direct Inward System Access).

If the Attendant is allowed to change the DISA access code, select COS Option 103 (Attendant DISA Code Setup) for the console.

To force the external caller to enter an Account Code rather than the standard DISA access code, select COS Option 810 (Special DISA) for the trunk.

## Features Description

---

- If the trunk is to be a DISA trunk during Night Service only, select COS Option 812 (DISA During Night Service Only) for the trunk, and set the DISA trunk DAY service routing in CDE Form 19.

Select the DISA answer timer via System Option 43 (DISA Answer Timer: 1-8 Seconds).

See Section MITL9108-093-210-NA, Customer Data Entry for further details.

### 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 – DPABX dial tone returned.
- Dial the required feature access code or extension.

### 4.33 DIRECT TO ARS

#### Description

This option allows the extension (or DISA trunk) to be directly routed to ARS without dialing the CO trunk access code (usually 9).

#### Conditions

- This feature will disable the maintenance test-line function if they are both in the COS of an extension.
- The extension cannot make internal calls.
- This feature is not available in software Generic 1000.

#### Programming

Select COS Option 217 (Direct To ARS) for the extension (or DISA trunk).

Assign an access code to Feature Number <sup>37</sup>36 (Direct to ARS). *Handwritten: 37, Handwritten: 36*

#### Operation

Lift the handset; dial ARS digits.

#### 4.34 DISCRIMINATING RINGING

##### Description

This feature provides two different ringing cadences to allow a user to distinguish between internal incoming calls (standard ringing) and external incoming or Attendant calls (discriminating ringing). The system can also be programmed to provide discriminating ringing for all calls.

Standard ringing: 1 second on, 3 seconds off.

Discriminating ringing: 1/2 second on, 1/2 second off,  
1/2 second on, 2 1/2 seconds off.

##### Conditions

None

##### Programming

To provide discriminating ringing on incoming trunk and Attendant calls:

- Select System Option 17 (Discriminating Ringing).
- Disable System Option 18 (Discriminating Ringing Always).

To provide discriminating ringing for all calls:

- Select System Option 17 (Discriminating Ringing Always).
- Disable System Option 18 (Discriminating Ringing).

If neither of System Options 17 nor 18 are selected, standard ringing will be provided for all calls.

To provide standard ringing only to specific trunks (while still providing discriminating ringing to others):

- Select COS Option 811 (Standard Ring Applies) for the specific trunks.

##### Operation

None

### 4.35 DTMF-TO-ROTARY DIAL 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 converter can accommodate a string of up to 26 digits. The DTMF digits also appear on the trunk, as early line split is not provided.

#### Conditions

None

#### Programming

None

#### Operation

None

#### 4.36 E&M TRUNK SUPPORT

##### Description

E&M trunks are supported with the E&M Trunk card (in the analog Peripheral bays) and the E&M Trunk module (on the Universal card, in the digital Peripheral bays), in the SX-200<sup>®</sup> DIGITAL PABX.

##### Conditions

None

##### Programming

Enter the trunk into the system's physical configuration table via CDE Form 01 (System Configuration).

Select options for the E&M trunk type via CDE Form 13 (Trunk Circuit Descriptors).

Select options for the specific trunk circuits via CDE Forms 14 (Non-Dial-In Trunks) and 15 (Dial-In Trunks).

See Section MITL9108-093-210-NA, Customer Data Entry for further details.

##### Operation

None

#### 4.37 FIXED NIGHT SERVICE

##### Description

This feature allows calls normally directed to the Attendant 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 Attendant are routed to the selected night assignment. Calls held in the Attendant 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: NIGHT1 and NIGHT2. The calls are directed to the assignment selected.

##### Conditions

The assignment of trunks may not be changed from the Attendant Console (see FLEXIBLE NIGHT SERVICE).

##### Programming

Assign incoming trunks and calls to the Attendant to the required extensions, hunt groups or common alerting devices via CDE Forms 14 (Non-Dial-In Trunks) and 19 (Call Rerouting Table).

##### Operation

Press the NIGHT1 key on the Attendant Console to select Night Service 1 assignments.

Press the NIGHT2 key on the Attendant Console to select Night Service 2 assignments.

### 4.38 FLASH PACKAGE

#### Description

The flash timer is a systemwide programmable item; its value applies to all extensions in the system.

The values may be set to:

Minimum Flash Timer: (10 ms units) 20-50  
Maximum Flash Timer: (10 ms units) 20-150

#### Conditions

None

#### Programming

The minimum and maximum flash times may be programmed via System Options 41 (Minimum Flash Timer) and 42 (Maximum Flash Timer).

#### Operation

None



### 4.39 FLEXIBLE NIGHT SERVICE

#### Description

This option allows the Attendant 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.

#### Programming

Select COS Option 104 (Attendant Flexible Night Service Setup) for the Console.

#### Operation

To change the night service assignment of a trunk, enter the following:

```
FUNCTION
ATT FUNCTION
MORE...
FLEX NIGHT
(enter the Trunk number)
NIGHT1 (or NIGHT2)
(enter the desired destination number)
SET
```

#### **4.40 FLEXIBLE NUMBERING PLAN**

##### **Description**

The numbering plan used within the system is completely flexible. The user may select any combination of 1-, 2-, 3-, 4- and 5-digit numbers. The only constraint in the selection of a numbering plan is that it must not conflict with a feature 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.

##### **Programming**

Assign the required extension numbers.

##### **Operation**

None

#### 4.41 HANG UP PRIORITY

##### Description

When an extension hangs up, calls waiting for this station will be served in the following order: Recall, Camp-On external; Camp-On internal; Callbacks.

##### Conditions

None

##### Programming

None

##### Operation

None

## 4.42 HOTEL/MOTEL FEATURES

### Description

The SX-200<sup>®</sup> DIGITAL PABX Hotel/Motel feature package provides standard PBX hotel/motel features such as Attendant Call Blocking, Message Registration, Automatic Wake-up and Room Status.

The following hotel/motel features are available:

- Attendant Call Block
- Automatic Wake-Up (Alarm Call)
- Message Register
- Room Status
- Automatic Room Status Conversion
- Room Call Restriction
- Attendant Guest Room Key Display.

### Conditions

- Hotel/motel features are not available in software Generic 1000.

### Programming

See 'Programming' for individual features.

### Operation

See 'Operation' for individual features.

---

## 4.43 HUNT GROUPS

### 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. Two types of hunting are provided by the system: Circular, and Terminal 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 Non-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.

A maximum of 50 hunt groups may be programmed.

The first extension in a Hunt Group list without Do Not Disturb activated, will receive a camp-on beep (and a SWAP/CAMPON softkey if it is a SUPERSET 4™ set) when all extensions in hunt group are busy.

### 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.

Extensions cannot be in more than one circular Hunt Group.

An extension with Do Not Disturb set or which is busied-out will be passed in the hunt.

An extension in a hunt group with call forwarding in effect will also be passed in the hunt.

### **Programming**

Program all extensions via CDE Form 9 (Stations/SUPERSET<sup>®</sup> Sets).

Program the Hunt Group:

- Enter the desired extensions.
- Enter the hunt group access code.
- Select CIRCULAR option if required.

### **Operation**

None

#### 4.44 ILLEGAL ACCESS INTERCEPT

##### Description

Calls to nonprogrammed or restricted access codes or extension numbers can be routed to a given answering point for completion. This point can be an LDN position on the Attendant Console (see ATTENDANT LDN KEYS) or any valid extension number. Illegal number intercept points can be programmed to be different or the same for DAY, NIGHT1, and NIGHT2 modes of system operation.

##### Conditions

If the required programming is not done, such calls will receive reorder tone.

##### Programming

To cause all calls to restricted numbers to be routed to a specific answering point, enter CDE Form 19 (Call Rerouting Table) to do the following:

- Enter the desired answering point access code, or extension number into the DAY column for the "Station Illegal Number Routing For This Tenant" Call Type.

##### Operation

None

**4.45 IMMEDIATE RING**

**Description**

Ringing is applied to a called idle extension number after the last digit has been dialed.

**Conditions**

None

**Programming**

None

**Operation**

None



#### 4.46 INHIBIT OVERLAP OUTPUTSING

##### **Description**

If this system option is selected, the ARS package will collect all dialed digits before outputting digits on the outgoing trunk.

##### **Conditions**

None

##### **Programming**

Select System Option 26 (No Overlap Outputting).

If variable length account codes are used, set the Unknown Digit Length Timer via System Option 36 (ARS Unknown Digit Length Time-out).

##### **Operation**

None

#### 4.47 LAST PARTY RECEIVES DIAL TONE

##### **Description**

If this system option is selected, the last party left after a call will receive dial tone instead of silence. The caller may initiate calls immediately upon hearing dial tone.

##### **Conditions**

None

##### **Programming**

Select System Option 22 (Last Party Clear - Dial Tone).

##### **Operation**

None

#### 4.48 LIMITED WAIT FOR DIAL TONE

##### **Description**

After a trunk has been accessed, the system will wait for between 3 and 15 seconds before assuming dial tone is present. If dial tone is detected before the time-out period expires, the system will begin outpulsing (or toning) at the time it receives dial tone. Should no dial tone be present after the time-out period, the system will automatically begin outpulsing (or toning).

##### **Conditions**

None

##### **Programming**

Set System Option 37 (Limited Wait for Dial Tone) for 3-15 seconds.

To program a trunk to wait for dial tone, select COS Option 802 (Limited Wait for Dial Tone) for the trunk.

##### **Operation**

None

#### 4.49 LINE LOCKOUT

##### **Description**

If an extension goes off-hook, and does not dial digits or go back on-hook for a length of time, the extension will be locked out. In the locked-out state, the extension cannot originate, or receive calls. The extension appears busy to potential callers. To remove the extension from the locked-out state, simply go back on-hook.

##### **Conditions**

Dial tone time-out is 15 seconds, with an additional 30 seconds of reorder tone before lockout is applied to the extension.

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**

None

##### **Operation**

None

#### 4.50 LINE LOCKOUT ALARM

##### **Description**

This feature, if selected, will cause a system alarm to be raised (MINOR) if the particular extension goes off-hook and times-out (does not dial within a certain period). The event will be logged.

##### **Conditions**

None

##### **Programming**

Select COS Option 227 (Lockout Alarm Applies) for the extension.

##### **Operation**

None - when the extension becomes locked out, an alarm log report is generated.

#### 4.51 LOCAL SWITCHING

##### **Description**

Local Switching allows two lines on the same analog equipment bay to be directly connected together, bypassing the normal switching route to the DX Switching Matrix in the Main Control.

This increases the traffic capacity of the system.

##### **Conditions**

Local switching can only be achieved for 2-party calls; all conference type calls are routed through the DX Switching Matrix.

Local switching applies only to analog bay line circuits.

##### **Programming**

None

##### **Operation**

None

---

## 4.52 MESSAGE REGISTRATION

### Description

This feature allows the system to accumulate the number of completed local call units made from an extension. The system may be programmed to count either external calls, or meter pulses. The Attendant may view and clear the message registers (see Attendant Message Register Display/Clear). The system may be programmed to generate an alarm at the attendant console when a message register overflows. Message Registration can apply to extensions and to trunks.

### Conditions

- The maximum message register count is 50,000.
- This feature is not available in software Generic 1000.
- If an extension with Message Registration connects to an outgoing trunk which does not have Message Registration, Message Registration will not apply to the extension.

### Programming

- Select COS Option 229 (Message Register Applies) for the extension(s) or trunk(s) for which a call count is to be maintained.
- Select System Option 23 (Message Reg. Count Additional Supervisions) to count meter pulses.
- Select COS Option 230 (Message Register Overflow Alarm) for the extension(s) or trunk(s) for which there is to be a message register overflow alarm indication at the Attendant Console.

### Operation

None

Also see Attendant Message Register Display/Clear.

### 4.53 MESSAGE WAITING

#### Description

This feature allows the Attendant to inform an extension user that there is a message waiting. The Message Waiting indication may be a continuously flashing lamp on the extension (if equipped), or the extension may be rung every 20 minutes with a distinctive ringing pattern (three 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 canceled. When the guest returns and calls the Attendant, the MSG. WAIT display is ON to indicate that there is a message waiting for that extension.

As an option, the system may be programmed to print a message on the system printer indicating each instance of a new message waiting.

#### Conditions

COS Options 231 (Message Waiting Setup – Bell) and 232 (Message Waiting Setup – Lamp) are mutually exclusive.

#### Programming

Select COS Option 231 (Message Waiting Setup – Bell) or 232 (Message Waiting Setup – Lamp).

Select System Option 04 (Message Waiting and Message Register Change Print) to print a message on the system printer whenever an extension has a new message waiting.

#### Operation

To answer a message waiting indication:

- Contact the Attendant.

To cancel message waiting:

- The Attendant must enter the following softkeys at the console while talking to the extension:

MSG WAITING  
RELEASE



#### 4.54 MULTI-ATTENDANT POSITIONS

##### **Description**

The system can handle multiple Attendant Consoles with unique Hold Slots for each Attendant. Incoming trunk calls can be programmed to appear at all consoles, or specific console(s). Similarly, extension "dial 0" calls, Priority calls, intercept to attendant calls, etc., can be programmed to appear at all consoles, or specific console(s).

Any console in a particular tenant group can switch that tenant group to night service (or day service).

See also TENANTING.

##### **Conditions**

In cases where a call appears at more than one console, the first console to answer will be connected to the call; other consoles attempting to answer will receive silence.

##### **Programming**

Assign consoles to the desired tenant groups via CDE Form 07 (Console Assignments).

##### **Operation**

All operations are identical for all Attendant Consoles in the same tenant group.

See Attendant Features.

**4.55 MULTIPLE EXTENSIONS**

**Descriptions**

A maximum of three industry standard station sets equipped with bells may be connected (hard-wired) together on one ONS line of the SX-200® DIGITAL PABX.

**Conditions**

None

**Programming**

None

**Operation**

None

#### 4.56 MUSIC ON HOLD (MOH)

##### **Description**

A music source may be connected to the System via a module on the universal card for use with Attendant Camp-On and Hold features. If music is not provided, calls that are held or camped on will hear silence (no tone). The actual music source is provided by the customer, and connected to a Music On Hold/Pager module on the Universal card.

See Section MITL9108-093-200-NA, Shipping, Receiving and Installation for wiring details.

##### **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.

Only one source of music may be connected to the system.

##### **Programming**

A Music on Hold Module must be programmed into CDE Form 18 (Miscellaneous System Ports).

##### **Operation**

None

#### 4.57 NIGHT BELLS

##### **Description**

This feature allows incoming and internal calls to be directed to common alerting devices. The call may be answered either from the Attendant Console, or from a station with TAFAS Access.

The system provides a contact closure which operates the alerting device. See TRUNK ANSWER FROM ANY STATION (TAFAS).

Night Bells may be activated via relays on a module which is fitted onto a Universal Card; see Section MITL9108-093-200-NA, Shipping, Receiving and Installation for details.

##### **Conditions**

None

##### **Programming**

The night bell relays in use must be specified, and given extension numbers (not conflicting with the numbering plan) in CDE Form 18 (Miscellaneous System Ports).

Assign the appropriate TAFAS access to any extension which is to answer calls appearing on common alerting devices.

Any call type can be routed to the common alerting device by entering the extension number of the appropriate night bell into CDE Form 19 (Call Rerouting Table) as desired.

##### **Operation**

None

#### 4.58 NIGHT SERVICES

##### **Description**

The Attendant can place the system (or particular tenant group or groups) into one of two different night service modes - NIGHT1 or NIGHT2. When the system or tenant group is in night service mode, incoming trunk calls and calls to the Attendant may be rerouted to specified extensions or be caused to activate common alerting devices (e.g., night bells).

##### **Conditions**

None

##### **Programming**

Enter the desired night destination extension numbers for any non-dial-in trunk into CDE Form 14 (Non-Dial-In Trunks).

Enter the desired night routing extensions for the various types of station/trunk calls into CDE Form 19 (Call Rerouting Table).

##### **Operation**

See ATTENDANT NIGHT/DAY SWITCHING.

## 4.59 NODE IDENTIFICATION

### Description

This feature eliminates the necessity of programming unique extension numbers across all nodes of a network of SX-200<sup>®</sup> DIGITAL PABXs. An extension user may dial anywhere in the network by dialing the Node Identification code followed by the extension number. The code may be from one to five digits in length. Extensions may dial other extensions within the same network node with or without the Node Identification code.

### Conditions

This feature is not available in software Generic 1000.

### Programming

Assign an access code to Feature Number 33 (Node ID).

### Operation

- Dial the Node Identification code.
- Dial an extension in any node of the network.

#### 4.60 OFF-PREMISE EXTENSION

##### Description

The OPS (Off-Premises) Line card is provided to allow extensions not in the immediate vicinity of the PABX to be directly connected to the DPABX without the use of special trunks.

If the extension is located more than 2 kilometers away, it may be necessary to add an AT&T balance network into the circuit - see 'Programming'.

##### Conditions

The 8-Station Line card may be used as an off-premise line card.

##### Programming

- If necessary, select COS Option 402 (Long Loop - Off-Premises Extension Only) for the extension.

##### Operation

None

#### 4.61 PAGING EQUIPMENT

##### **Description**

Paging equipment may be connected to the equipment via a Universal Card module (Paging/Music-on-Hold module). Up to nine paging zones can be provided. Refer to Section MITL9108-093-125-NA, System Functional Description (Universal Card Description) for additional information.

##### **Conditions**

None

##### **Programming**

The paging equipment in use must be specified in CDE Form 18 (Miscellaneous System Ports).

##### **Operation**

See Station Feature PAGING ACCESS.



## 4.62 PICKUP GROUPS

### Description

Extensions may be entered into pickup groups, permitting them to answer any call to any other extension within their particular groups. See DIAL CALL PICKUP.

### Conditions

A maximum of 50 Pickup groups are permitted per system, with a maximum of 50 extensions permitted per group.

### Programming

Assign the desired extensions to the appropriate pickup groups via CDE Form 10 (Pickup Groups).

### Operation

See DIAL CALL PICKUP.

## 4.63 POWER FAIL TRANSFER (PFT)

### 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 maintenance panel transfer switches to TRANSFER. When normal system operation is restored, calls on the transfer circuits remain in effect until they are terminated.

Generally, there are three possible circumstances which will cause a power fail transfer; they are:

- The main control card stops functioning (all bays are cut over into PFT mode).
- The link between the main controller and one of the analog equipment bays stops functioning (the affected bays are cut over into PFT mode).
- On power-up, one of the analog bays fails to initialize properly (the affected bays are cut over into PFT mode).

### Conditions

If a transfer takes place, any existing calls on the transferred trunks are dropped.

Ground start trunks require a Ground-to-Loop converter.

If trunks are rotary dial only, DTMF sets may not be used for dialing.

SUPERSET 3™ or SUPERSET 4™ sets may not be used as Power Fail Transfer extensions.

### Programming

None

### Operation

To manually activate PFT, set the maintenance panel Master Transfer Switches to TRANSFER, as required.

---

## 4.64 PRINTER SUPPORT

### Description

The SX-200<sup>®</sup> DIGITAL PABX can accommodate an RS-232 interfaced printer through the printer port located on the backplane of Bay 2. See Section MITL9108-093-200-NA, Shipping, Receiving and Installation for further details. SMDR reports, Traffic Measurement reports and Maintenance Log reports are all directed to the system printer. For specific information on these categories, refer to the following Sections:

- (a) Maintenance Log printing: MITL9108-093-351-NA
- (b) Traffic Measurement printing: MITL9108-093-450-NA
- (c) SMDR report printing: MITL9108-093-451-NA.

### Conditions

A functioning printer must always be connected to the system. If the printer fails, or is disconnected, outgoing trunk calls will be disabled as soon as the internal storage buffer is filled up. The system has an internal SMDR record buffer large enough to handle 75 SMDR records; this will provide sufficient time for printer maintenance.

### Programming

None

### Operation

None

## 4.65 PROGRAMMABLE LDN NUMBERS

### Description

Each Attendant has programmable Listed Directory Number (LDN) positions. Up to nine LDN keys and labels may be programmed to appear. The Attendant Console will identify LDNs at the console. Each Listed Directory Number may be assigned to a separate LDN key, allowing the Attendant to answer the incoming call with an appropriate response.

### Conditions

A console's LDN numbers are unique; each console must have its own LDN numbers explicitly programmed.

### Programming

The console's LDN positions can be assigned access codes via CDE Form 08 (Attendant LDN Assignments). These must not conflict with the existing access codes, or the numbering plan.

Any type of call may be programmed to appear in any of the console's LDN softkey positions via CDE Form 19 (Call Rerouting Table); using the access codes programmed into CDE Form 08.

See Section MITL9108-093-210-NA, Customer Data Entry for details.

### Operation

None

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## 4.66 RANGE PROGRAMMING OF STATIONS AND SUPERSET® SETS

### Description

This feature allows range programming for blocks of extensions. By entering a range of equipment numbers, one may assign extension numbers, Class Of Restriction (COR), or Class Of Service (COS) to a selected block of equipment numbers. The start extension number or COS number is entered by the programmer. The extensions are assigned sequentially starting at the entered value, and the COS and COR are assigned to the entire group.

### 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, ----.

### Programming

See Section MITL9108-093-210-NA, Customer Data Entry for full details of programming.

### Operation

See Section MITL9108-093-210-NA, Customer Data Entry for full details of operation.

### 4.67 RESALE PACKAGE

#### Description

The Resale Package is a method of offering the system's ARS "Least Cost Routing" facilities to external users requiring low cost Long Distance calling, much like the offerings of Other Common Carriers.

DISA trunks are installed for external access to the system. The external user dials up one of the DISA trunks, enters a verified account code, and dials the desired external number.

This feature is actually a specialized application of the SX-200® Generic 1001 Automatic Route Selection (ARS), Toll Control and Verified Account Code features.

#### Conditions

See 'Verified Account Codes' and 'Automatic Route Selection'.

#### Programming

- DISA trunks are programmed into CDE forms 01, 13 and 15 - see Direct Inward System Access.
- Select COS Option 810 (Special DISA) for each of the DISA trunks to force the user to enter a verified account code.
- Select COS Option 217 (Direct to ARS) for each DISA trunk.
- Program verified account codes - see programming for Verified Account Codes.
- Select a 'Direct to ARS' access code which corresponds to the desired ARS leading digits.

#### Operation

- Dial into system via DISA trunk.
- Enter a verified account code.
- Make call as required.

#### 4.68 RINGING PLAN

##### **Description**

The SX-200<sup>®</sup> DIGITAL PABX provides the North American ringing plan, used with the tone plan and rotary dial pulse-to-digit conversion features to enable the system to be used in the North American marketplace. The ringing plan is stored in the database on the system floppy disk.

##### **Conditions**

None

##### **Programming**

None

##### **Operation**

None

#### 4.69 RINGING TIME-OUT

##### Description

An extension can ring for 1 to 5 minutes before the call is dropped (default ringing time is 1 minute).

##### Conditions

None

##### Programming

Select System Option 40 (Final Ring Time-out), and set the desired time-out period.

##### Operation

None



---

## 4.70 ROOM STATUS

### Description

This feature allows the attendant to view, print and change the status of a room. An extension user is also permitted to change the status of the room. There are four room status parameters:

- Vacant/Occupied - set by the Attendant
- Clean/Dirty - set by the Attendant
- Internal/Local/Long Distance privileges - set by the Attendant
- Maid In Room - set from extension.

The room status will appear on the second line of the attendant console LCD display. The system may be programmed to change all of the room status' from "clean" to "dirty" at a predetermined time.

### Conditions

- System Features 32 (Outgoing Call Restriction) and 33 (Room Status) are mutually exclusive.
- This feature is not available in software Generic 1000.

### Programming

- Select System Option 33 (Room Status).
- Select COS Option 244 (Room Status Applies) for all extensions which room status is to apply.
- Select COS Option 101 (Attendant O/G Restriction/Room Status Setup) for the Attendant Console.
- Select System Option 27 (Room Status Audit Enable) to allow room status printouts.
- Select System Option 34 (Auto Room Status Conversion/Auto Wake-Up Print) to allow all room status' to be changed from "clean" to "dirty" at a predetermined time.
- Select System Option 45 (Auto Room Status Conversion/Wake-Up Timer) and enter the desired conversion time.
- Assign an access code to Feature 34 (Maid In Room).
- Set a default Room Status Call Restriction type via System Feature 46 (Room Status Call Restriction Default).

### Operation

To view the status of a room at the Attendant Console, press the following keys:

FUNCTION  
GUEST ROOM  
(enter the extension/room number)  
STATUS

To change the status of the room from the Attendant Console, press the following keys:

FUNCTION  
GUEST ROOM  
(enter the extension/room number)  
STATUS  
OCCUPIED or VACANT / CLEAN or DIRTY

To change the telephone privileges of an extension, press the following keys:

FUNCTION  
GUEST ROOM  
(enter the extension/room number)  
STATUS  
INTERNAL or LOCAL or LONG DIST

To print the room status' on the system printer, press the following keys:

FUNCTION  
GUEST ROOM  
AUDITS  
ROOM STATUS

To change room status from the room/extension:

- Dial the 'Maid In Room' access code.
- Dial one of 1, 2 or 3:
  - 1 - maid is in room
  - 2 - no maid in room
  - 3 - room clean, maid not in room

#### 4.71 ROTARY-TO-DTMF CONVERSION

##### **Description**

Provided as an option within ARS digit strings, this feature causes dialing to be converted from rotary dialing to DTMF dialing for the duration of dialing on that call.

##### **Conditions**

None

##### **Programming**

None

##### **Operation**

None

## 4.72 SATELLITE PBX

### Description

The SX-200<sup>®</sup> DIGITAL PABX can be applied as a satellite PBX. In this configuration, the SX-200<sup>®</sup> DIGITAL PABX will have no direct connection to the serving central office for incoming traffic. It has no directory number and receives all its incoming calls from another PBX via tie trunks. Some gain settings for the loss and level plan must be adjusted before the SX-200<sup>®</sup> DIGITAL PABX can operate as a satellite PBX. These changes are done automatically during programming.

### Conditions

None

### Programming

Select System Option 31 (Satellite PBX).

### Operation

None

### 4.73 STATION MESSAGE DETAIL RECORDING (SMDR)

#### Description

Station Message Detail Recording (SMDR) allows data to be collected for each outgoing and incoming trunk call. This data may be output to a printer or recording device. 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 abbreviated dial originated calls.

See Section MITL9108-093-451-NA, Station Message Detail Recording, for details.

#### Conditions

- See Section MITL9108-093-451-NA, Station Message Detail Recording, for details.

#### Programming

The following COS Options may be selected:

COS Option	COS Option Number
SMDR - Does Not Apply	700
SMDR - Drop Calls < n digits (0...11, disable=0)	803
SMDR - Drop Incomplete Outgoing Calls	804
SMDR - Extended Record	805
SMDR - Overwrite Buffer	702
SMDR - Record Incoming Calls	807
SMDR - Record Meter Pulses	808

System Option	System Option Number
SMDR Indicate Long Calls	28

See Sections MITL9108-093-451-NA, Station Message Detail Recording and MITL9108-093-210-NA, Customer Data Entry for programming details.

#### Operation

None

#### 4.74 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 Attendant (during Day Service) or to the extension that originally answered the call (during Night Service). If an extension, during transfer, hangs up before completing dialing, the call which was held (by the original extension flashing) automatically calls back that extension.

##### **Conditions**

This feature applies only to trunk calls.

##### **Programming**

Use COS Option 115 (Attendant-Timed Recall - NO ANSWER) to set the 'no answer' recall time-out period.

Use COS Option 116 (Attendant-Timed Recall - HOLD) to set the 'hold' recall time-out period.

Use COS Option 117 (Attendant-Timed Recall - CAMP ON) to set the 'camp on' recall time-out period.

##### **Operation**

None

## 4.75 SUPERSET 3™ SET

### Description

The SX-200® DIGITAL PABX system supports SUPERSET 3™ electronic telephone sets. The SUPERSET 3™ set can have up to 14 Speed Dial numbers and one line appearance (Prime Line). The set can alternately have up to three line appearances (including Prime Line) and 12 Speed Dial numbers. In addition to these 15 keys, there is one red key (hold) and six feature keys. For additional information, refer to Section MITL9108-093-106-NA, SUPERSET 3™ Set Information.

### Conditions

None

### Programming

SUPERSET 3™ sets must be programmed into CDE Form 09 (Stations/SUPERSET® Sets), and their Class-Of-Service (COS) Options must be selected in CDE Form 03 (COS Define).

All of the Station Features described in this practice are available to SUPERSET 3™ Set users, as well as the following special SUPERSET® options:

COS Option	COS Option Number
Override	500
Override Announce	501
SUPERSET® - Auto-Answer	600
SUPERSET® - Auto-Hold Disable	601
SUPERSET® - Disconnect Alarm	603
SUPERSET® - Immediate Line Select	604
SUPERSET® - Sub-Attendant	606

System Option	System Option Number
SUPERSET® Set Last Number Redial	29

Feature	Feature Access Code
Auto-Answer Activation	02

These options are described in Section MITL9108-093-106-NA, SUPERSET 3™ Set Information.

### Operation

Refer to Section MITL9108-093-106-NA, SUPERSET 3™ Set Information.

## 4.76 SUPERSET 4™ SET

### Description

The SX-200® DIGITAL PABX system supports SUPERSET 4™ electronic telephone sets. The SUPERSET 4™ set can have up to 14 Speed Dial numbers and one line appearance (Prime Line). The set can alternately have up to 15 line appearances (including Prime Line) and no Speed Dial numbers. In addition to these 15 keys, there is one red key (hold), four feature keys and six softkeys. The SUPERSET 4™ set incorporates a Liquid Crystal Display (LCD) for line status indication, user prompting and displays such as message waiting, time and date. For additional information, refer to Section MITL9108-093-107-NA, SUPERSET 4™ Set information.

### Conditions

None

### Programming

SUPERSET 4™ sets must be programmed into CDE Form 09 (Stations/SUPERSET® Sets), and their Class-Of-Service (COS) Options must be selected in CDE Form 03 (COS Define).

All of the Station Features described in this practice are available to SUPERSET 4™ Set users, as well as the following special SUPERSET® options:

COS Option	COS Option Number
Override	500
Override Announce	501
SUPERSET® - Auto-Answer	600
SUPERSET® - Auto-Hold Disable	601
SUPERSET® - Background Music	602
SUPERSET® - Disconnect Alarm	603
SUPERSET® - Immediate Line Select	604
SUPERSET® - Message Program	605
SUPERSET® - Sub-Attendant	606
SUPERSET® - Associated Modem Line	607
SUPERSET® - Room Status Display	608
SUPERSET® - Night Service Switching	609

Feature	Feature Access Code
SS4 Room Status Display	35
SUPERSET 4™ Set Loopback Test	26

System Option	System Option Number
SUPERSET® Set Last Number Redial	29
Holiday Messages	20



These options are described in Section MITL9108-093-107-NA, SUPERSET 4™ Set Information.

**Operation**

Refer to Section MITL9108-093-107-NA, SUPERSET 4™ Set Information.

#### 4.77 SWITCHHOOK FLASH TIMER OPTIONS

##### Description

This feature defines the maximum and minimum durations of a switch-hook flash as follows:

Minimum Flash Timer: (10 ms units) 20-50  
Maximum Flash Timer: (10 ms units) 20-150

##### Conditions

None

##### Programming

Use System Options 41 (Minimum Flash Timer) and 42 (Maximum Flash Timer) to set the desired times.

##### Operation

None

#### 4.78 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.

##### **Conditions**

This is done from the Attendant Console.

##### **Programming**

None

##### **Operation**

To set a system identifier, enter the following:

```
FUNCTION
ATT FUNCTION
SYSTEM IDENT
  (enter the desired System Identity number)
SET
```

To view the current system identity number:

```
FUNCTION
ATT FUNCTION
SYSTEM IDENT
  (the current System Identity number is displayed)
EXIT
```

**4.79 TANDEM OPERATION**

**Description**

The SX-200<sup>®</sup> DIGITAL PABX can support a tandem operation arrangement, using Tie trunks to connect two systems together.

**Conditions**

Appropriate Automatic Route Selection (ARS) must be provided.

**Programming**

None

**Operation**

None

## 4.80 TENANTING

### Description

Tenanting is a feature of the SX-200<sup>®</sup> DIGITAL PABX which allows several customers, each with independent Attendant Consoles, to share the same system.

The system can be programmed to enable each tenant's section of the system to be completely independent of other tenants; calls between tenants can be made only through CO trunks.

Tenanting can also be used to segregate different departments of the same company. In this case, all departments can have access to all telephones, services, and special trunks associated with the system. Each department may have its own dedicated Attendant and Attendant Console.

### Conditions

A maximum of 25 Tenant groups may be programmed.

**Important:** If tenanting is used to segregate departments, the Tenant Night Switching Assignment Form (CDE Form 06) must be programmed accordingly. Refer to Section MITL9108-093-210-NA, Customer Data Entry for further information on this form.

### Programming

Assign consoles to the desired tenant groups via CDE Form 07 (Console Assignments).

Assign extensions and SUPERSET<sup>®</sup> Sets to the desired tenant groups via CDE Form 09 (Stations/SUPERSET<sup>®</sup> Sets).

Assign trunks to the desired tenant groups via CDE Forms 14 (Non-Dial-In Trunks) and 15 (Dial-In Trunks).

Assign the desired day and night service numbers in CDE Form 19 (Call Rerouting Table).

See Section MITL9108-093-210-NA, Customer Data Entry for further information.

### Operation

None

## 4.81 TOLL CONTROL

### Description

The Toll Control feature forms part of the Automatic Route Selection (ARS) feature. It allows a means to restrict the calls that certain groups of extensions may place. This may mean denying all outside calls, denying calls to specific locations, denying calls over expensive routes, or any combination of these.

See AUTOMATIC ROUTE SELECTION (ARS).

### Conditions

See Section MITL9108-093-213-NA, Automatic Route Selection.

### Programming

See Sections MITL9108-093-213-NA, Automatic Route Selection, and MITL9108-093-210-NA, Customer Data Entry.

### Operation

See Section MITL9108-093-213-NA, Automatic Route Selection.

## 4.82 TONE DEMONSTRATION PACKAGE

### Description

This is a special facility to train the user to recognize the various tones generated by the system.

### Conditions

None

### Programming

Assign an access code to Feature 27 (Tone Demonstration).

### Operation

Dial the tone demonstration package feature access code plus the code for the tone you wish to hear:

- 10 - Silence
- 11 - Dial Tone
- 12 - Transfer Dial Tone
- 13 - Busy Tone
- 14 - Special Busy Tone
- 15 - Standard Ringback Tone
- 16 - Silence
- 17 - Reorder Tone
- 18 - Conference Tone
- 19 - Call Waiting (Camp-on) Tone
- 20 - Intrusion (Override) Tone
- 21 - Interrupted Dial Tone
- 22 - Silence
- 23 - Waiting Tone (Silence, or Music on Hold)
- 24 - Paging Tone
- 25 - Silence
- 26 - Trunk Camp-on Double Beep Tone
- 27 - ARS Warning Tone
- 28 - ARS Dial Tone
- 29 - Override Warning Tone
- 30 - Privacy Release Tone
- 31 - Auto-Answer Call End Tone
- 32 - Attendant Error Tone

### 4.83 TONE PLAN

**Description**

To accommodate the numerous tones which can be generated when dialing telephone numbers in the North American region, the system has the North American tone plan co-existing on the same system's floppy disk as the Ringing Plan.

**Conditions**

None

**Programming**

None

**Operation**

None



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## 4.84 TRAFFIC MEASUREMENT

### Description

Traffic measurements can be made on SX-200<sup>®</sup> DIGITAL PABX systems, and the results presented at the RS-232C printer port for a suitable output device (printer or magnetic tape unit). The types of measurements made include the following:

- DTMF Receiver usage
- PCM Channel usage
- Console usage
- Trunk group usage
- Trunk usage

- 1 s dial tone
- 2 s dial tone
- 3 s dial tone
- Console calls
- Dial 0 calls
- Extension origins
- Intercepted calls
- Recalls
- Line and Trunk activity
- Illegal calls

- Callback
- Call forward
- Call hold
- Call pickup
- Camp-on
- Console conference
- Console hold
- Console originations
- Do not disturb
- Extension conference
- Flash hold
- Hold pickup
- Msg waiting
- Override
- Paging
- Serial call
- TAFAS

In software Generic 1001 there are two additional measurements:

- Hunt group busy
- Hunt group usage

Information is accumulated during a user-programmed time period, and is then available for output. Programming is done from the RS-232 Maintenance Terminal, or the Attendant Console.

See Section MITL9108-093-450-NA, Traffic Measurement for details.

## Features Description

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### **Conditions**

See Section MITL9108-093-450-NA, Traffic Measurement for details.

### **Programming**

See Section MITL9108-093-450-NA, Traffic Measurement for details.

### **Operation**

See Section MITL9108-093-450-NA, Traffic Measurement for details.

4.85 TRUNK CIRCUIT DESCRIPTOR OPTIONS

**Description**

Trunk circuit descriptors specify the programmable hardware parameters of each trunk circuit in the SX-200<sup>®</sup> DIGITAL PABX. These are complemented by the switch settings on the analog SX-200<sup>®</sup> trunk card types. The system supports a maximum of 25 different trunk circuit descriptors. All trunks in the system must have a trunk descriptor number with an associated set of selected options. Table 4-1 lists the trunk descriptor options available for each of the trunk types.

**TABLE 4-1  
TRUNK HARDWARE OPTIONS**

<b>Trunk Type: 4-CIRCUIT CO TRUNK and 4-CIRCUIT DISA</b>
Far-End Gives Answer Supervision Inhibit Automatic Supervision No Seize Alarm No Release Alarm Toll Office Is this a CO DTMF Impedance (600 Ohms or Complex) Dictation Trunk
<b>Trunk Type: 6-CIRCUIT CO TRUNK and 6-CIRCUIT DISA</b>
Far-End Gives Answer Supervision Inhibit Automatic Supervision No Seize Alarm No Release Alarm Toll Office Is this a CO DTMF Impedance (600 Ohms or Complex) Post Call Metering (0 -15 s) x (1 s increments) Calling Party Disconnect Timer (1 -12 min) x (1 min inc) Dictation Trunk Ignore Remote Disconnect Disconnect Timer (100 - 9900 ms) x (100 ms increments) Supervision Direction: Incoming Trunk Calls Also Guard Timer (0 - 3000 ms) x (100 ms increments) Ring Cycle Timer (6 -10 s) x (1 s increments) Ignore Line Reversal During Seizure Ringing Expected Ringing Debounce Timer (5 -12 s) x (1 s increments) Seize Timer (10 - 60 s) x (10 s increments) Flash Timer (200 - 700 ms) x (100 ms increments) Interdigit Timer (300 - 800 ms) x (100 ms increments) Digit Outpulsing Ratio (60/40, 30/20, 66/33)

**TABLE 4-1 (CONT'D)  
TRUNK HARDWARE OPTIONS**

<p><b>Trunk Type: E&amp;M MODULE</b></p> <p>Far-End Gives Answer Supervision          Inhibit Automatic Supervision          No Seize Alarm          No Release Alarm          Toll Office          Is this a CO          DTMF          Impedance [Use DIP Switch on the Module to Program]              (600 Ohms or Complex)          E Lead Invert          M Lead Invert          Ignore Remote Disconnect          Disconnect Timer (150 - 300 ms) x (50 ms increments)          Release Acknowledge Timer (2000 - 9900 ms) x (100 ms inc)          Guard Timer (200 - 1000 ms) x (100 ms increments)          Dictation Trunk          Incoming Start Type (Immed, Wink, Delay)          Debounce Timer (20 - 300 ms) x (10 ms increments)          Wink Timer (150 - 300 ms) x (50 ms increments)          Outgoing Start Time (Immed, Wink, Delay or Delay Integ)          Digit Outputing Ratio (60/40, 30/20, 66/33)          Outpulse Delay Timer (100 - 2000 ms) x (100 ms increments)          Flash Timer (200 - 700 ms) x (100 ms increments)          Interdigit Timer (300 - 800 ms) x (100 ms increments)          Wait for Delay Timer (300 - 5000 ms) x (100 ms inc)          Remote End is a Satellite          Remote End is a Satellite with OPS Lines          4-Wire          4-Wire Unamplified</p>
<p><b>Trunk Type: E&amp;M CARD</b></p> <p>Far-End Gives Answer Supervision          Inhibit Automatic Supervision          No Seize Alarm          No Release Alarm          Toll Office          Is this a CO          DTMF          Impedance (600 Ohms or Complex)          Remote End is a Satellite          Remote End is a Satellite with OPS Lines          Dictation Trunk</p>

**TABLE 4-1 (CONT'D)  
TRUNK HARDWARE OPTIONS**

<b>Trunk Type: 2-CCT DID/TIE</b>
Far-End Gives Answer Supervision Inhibit Automatic Supervision No Seize Alarm No Release Alarm Toll Office Is this a CO DTMF Impedance (600 Ohms or Complex) Remote End is a Satellite Remote End is a Satellite with OPS Lines
<b>Trunk Type: 6-CCT DID</b>
Far-End Gives Answer Supervision Inhibit Automatic Supervision No Seize Alarm No Release Alarm Toll Office Is this a CO DTMF Impedance (600 Ohms or Complex) Ignore Remote Disconnect Disconnect Timer (150 - 300 ms) x (50 ms increments) Release Acknowledge Timer (2000 - 9900 ms) x (100 ms inc) Start Type Debounce Timer (20 - 150 ms) x (10 ms increments) Wink Timer (150 - 300 ms) x (50 ms increments) Remote End is a Satellite Remote End is a Satellite with OPS Lines

**Trunk Descriptor Definitions**

- **Far-End Gives Answer Supervision**

If selected, answer signals will be expected, and acted upon when received on the trunk; answer signals are not generated internally.

If not selected, answer signals received will be ignored; answer signals will be generated internally, using a timer and pseudo answer supervision (System Option 38).

- **Inhibit Automatic Supervision**

If selected, system will wait for the far-end to provide answer supervision; no system-simulated answer supervision will be provided.

- **No Seize Alarm**

If selected, a trunk failing to return a seize acknowledgement on three successive occasions will be removed from service; maintenance will be notified.  
If not selected, the trunk will remain in service.
- **No Release Alarm**

If selected, a trunk failing to release will be removed from service; maintenance will be notified.  
If not selected, the trunk will remain in service.
- **Impedence**

"600" should be selected if the trunk is to be connected to a carrier facility, or the cable is short. This setting provides a 600 ohm + 2 $\mu$ F termination impedance match for the incoming line.

"Complex" should be selected if the trunk is to be connected directly to cable facilities. This setting provides the standard AT&T complex balance network as a termination impedance for the incoming line.
- **Toll Office**

Select if the CO trunk is to be connected to a Toll Office. This option is applicable to systems using the North American loss plan. It provides a 3 dB loss for trunk-to-OPS line connections, and a 6 dB loss for trunk-to-ONS line connections.  
If not selected, "normal" through switch loss will be provided.
- **Long Loop**

This option is applicable to systems using the UK loss plan. If selected, this option provides 1 dB gain for trunk-to-ONS line connections, and 4 dB loss for ONS line-to-trunk connections.  
If not selected, a 2 dB loss is provided for trunk-to-ONS line connections, and a 6 dB loss is provided for ONS line-to-trunk connections.
- **Is this a CO**

Select if trunk is to terminate at the Central Office.
- **DTMF**

If selected, will allow DTMF digits to be transmitted through the trunk.  
If not selected, tone-to-pulse conversions will be performed.

- Post Call Metering (0 – 15 s) x (1 s inc)

This defines how long the system will wait for and record meter pulses after the release signal is received.

- Calling Party Disconnect Timer (1 – 12 min) x (1 min inc)

This defines how long the system will wait for the far-end, a ground start trunk, to acknowledge a trunk release.

- Dictation Trunk

If selected, this will keep the caller's DTMF receiver for the duration of the call, such that the tone-to-pulse conversions may be performed.

- Ignore Remote Disconnect

If selected, release signals from the far-end will be ignored. If not selected, release signals will cause disconnection of the call.

- Disconnect Timer (100 – 1000 ms) x (100 ms inc)

This defines the time a release signal must be continuously present before a call is disconnected.

- Guard Timer (0 – 3000 ms) x (100 ms inc)

This defines how long the system will wait after releasing the trunk before seizing it again for an outgoing call.

- Ring Cycle Timer (5 – 10 s) x (1 s inc)

This defines a period during which a minimum ring burst (250 ms) must be present before the system will recognize it as an incoming call.

- Ignore Line Reversal During Seizure

If selected, line reversal will not be recognized as an incoming seizure.

- Ringing Expected

If selected, incoming calls are not reported unless ringing is recognized. If other seize signals are received before ringing, the trunk is busied-out for outgoing calls, but the incoming call is not reported until ringing is received.

- Ringing Debounce Timer (5 – 12 s) x (1 s inc)

This defines the duration during which the system tries to detect the minimum ring burst, indicating the persistence of an incoming call.

- Seize Timer (10 – 60 s) x (1 s inc)

This defines the time the system will wait for a seize acknowledge from a ground start trunk. If this times-out three times in succession, the trunk will be removed from service, and maintenance will be notified.

- Flash Timer (200 – 700 ms) x (100 ms inc)

This defines the duration of a flash-hook transmitted on to the trunk.

- Interdigit Timer (300 – 800 ms) x (100 ms inc)

This defines the time gap inserted between outputted digits.

- Remote End is a Satellite

Select if the trunk is to terminate at a satellite PBX.

- Remote End is a Satellite with OPS lines

Select if the trunk is to terminate at a satellite PBX with OPS lines.

- E lead invert/ M lead invert

These two fields provides the flexibility to specify the polarity of the E and M leads to match the far end connection.

- Release acknowledge timer

Range 2000–9900 ms, 100 ms increments. This specifies the time-out period to wait for a release acknowledge signal from the far end.

- Guard timer

Range 200–1000 ms, 100 ms increments. This specifies the guard time used to bar outgoing calls after releasing a call.

- Incoming start type

This field specifies the incoming type of the trunk, which can be set to immediate incoming, wink start incoming or delay dial incoming.



- Debounce timer

Range 20–50 ms, 10 ms increments. This timer specifies the period for which an incoming seizure is to be debounced before being recognized as a valid incoming seizure.

- Wink timer

Range 150–300 ms, 50 ms increments. This specifies the length of the wink signal sent to far end if trunk is wink start incoming or delay dial incoming.

- Outgoing start type

This field specifies the outgoing type of the trunk, which can be set to immediate outgoing, wink start outgoing, delay dial outgoing or delay dial with integrity.

- Digit outputting ratio

This field specifies the break/make ratio during outputting. It can be set to 50/40, 66/33 or 30/20.

- Outpulse delay timer

Range 100–2000 ms, 100 ms increments. This timer specifies the pause between seizing and the start of dialing, applicable to immediate outgoing trunks only. This value should be specified after determining the far end characteristics.

- Interdigit timer

Range 300–800 ms, 100 ms increments. This timer specifies the length of the interdigit pause during outputting.

- Wait for delay timer

Range 300–5000 ms, 100 ms increments. This timer specifies the period to wait for the delay signal from the far end. It is only applicable if the trunk is of type delay dial outgoing (without integrity).

### Conditions

None

### Programming

Trunk circuit descriptors are selected in Form 13 (Trunk Circuit Descriptors). See Section MITL9108–093–210–NA, Customer Data Entry for further information.

If the system is to provide pseudo answer supervision, set an appro-

## Features Description

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appropriate time for the time-out period via System Option 38 (Pseudo Answer Supervision Timer = 10 – 60 Seconds).

### **Operation**

None

---

## 4.86 TRUNK CONNECT

### Description

This feature allows an Attendant, station user or SUPERSET<sup>®</sup> set user to connect specific types of trunks together. Also see 'Device Inter-connection'.

### Conditions

- At least one of the trunks in a connection must provide release supervision, or the connection will not automatically release from the system when the call is completed.
- These options override the rules specified in 'Device Inter-connection Table' (CDE Form 29).

### Programming

Select the Trunk Connect COS Options as required:

- 313 (CO Trunk To CO Trunk Connect)
- 314 (CO Trunk To Tie Trunk Connect)
- 315 (CO Trunk To DID Trunk Connect)
- 316 (Tie Trunk To Tie Trunk Connect)
- 317 (Tie Trunk To DID Trunk Connect)
- 318 (DID Trunk To DID Trunk Connect)
- 319 (Extension non-CO Trunk To Trunk Connect)
- To specifically prevent an attendant from connecting a DID trunk to a non-CO type trunk, select System Option 16 (DID to Non-CO Trunk Via Attendant Inhibit).

### Operation

None

## 4.87 TRUNK GROUPS

### Description

This feature controls extension access to selected groups of trunks. Trunk groups are defined, and used in the ARS CDE forms to control extension access to trunks. Extensions have access to the trunk groups through their Classes of Restriction (CORs). For further information, refer to Sections MITL9108-093-213-NA, Automatic Route Selection, and MITL9108-093-210-NA, Customer Data Entry.

### Conditions

- A maximum of 50 individual trunk groups are available.
- A maximum of 50 trunks are permitted in an individual trunk group.
- A trunk may be a member of only one trunk group.
- All trunks within a group must be of the same type.
- Individual trunks must be programmed before they are entered into trunk groups.

### Programming

Trunks are entered into trunk groups via CDE Form 16 (Trunk Groups).

Each trunk group may be given a unique systemwide name via CDE Form 16 as well.

Stations and SUPERSET<sup>®</sup> Sets are assigned their CORs in CDE Form 09 (Stations/SUPERSET<sup>®</sup> Sets).

Station/SUPERSET<sup>®</sup> access to trunk groups is determined using the ARS CDE forms (primarily Form 20 - ARS: COR Group Definition).

See Sections MITL9108-093-210-NA, Customer Data Entry and MITL9108-093-213-NA, Automatic Route Selection Description for further information.

### Operation

None

## 4.88 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

- COS Options 401 (Call Park) and 403 (Trunk Recall Partial Inhibit) are mutually exclusive.

### Programming

- Select COS Option 403 (Trunk Recall Partial Inhibit) for the extension.

### Operation

None

## 4.89 TRUNKS - MISCELLANEOUS OPTIONS

### Description

- (a) Any trunk in the system may be programmed to ignore incoming DTMF digits, and recognize only rotary digits.
- (b) Any trunk in the system may be programmed to wait a specified time for dial tone before outpulsing digits. When the time-out period expires, digits are outpulsed with, or without dial tone. Also see LIMITED WAIT FOR DIAL TONE.

### Conditions

None

### Programming

To program a trunk to ignore incoming DTMF digits, select COS Option 801 (Incoming Trunk Call Rotary Only) for the trunk.

To program a trunk to wait for dial tone, select COS Option 802 (Limited Wait For Dial Tone) for the trunk.

Enter a value for the Limited Wait For Dial Tone Timer (Option 37 in CDE Form 04 - System Options and Timers).

### Operation

None

---

## 4.90 UNIFORM CALL DISTRIBUTION

### Description

UCD enables a large volume of incoming trunk traffic to be concentrated onto one or more hunt groups of extensions (agents) within the system. The calls would all be of a similar nature and the Agents would be trained to provide the information/service that the caller is requesting. If all the Agents are busy, the call is routed to a hunt group of recording devices. If the Agents are still busy after the caller listens to the recording, Music On Hold will be heard (if provided). The calls will then be recalled to a designated answering point after a pre-determined time.

### Conditions

This feature is not available in software Generic 1000.

### Programming

- Enter a series of extension numbers into a hunt group in CDE Form 17 (Hunt Groups).
- Press the "GROUP TYPE" softkey, followed by the "AGENT" softkey - refer to Section MITL9108-093-210-NA, Customer Data Entry for further information.
- Enter the extension numbers of the ONS ports to which the recording devices are connected, into another hunt group.
- Press the "GROUP TYPE" softkey, followed by the "RECORDING" softkey - refer to Section MITL9108-093-210-NA, Customer Data Entry for further information.
- Enter the extension of the recording device hunt group into CDE Form 19 (Call Rerouting Table), under "UCD Recording Routing For This Tenant". Incoming calls received during Night Service should be routed to an ONS port connected to an answering machine.
- Enter an On Hold Time-out period via COS Option 254 (UCD Music On Hold Timer), for each recording device.
- Enter an On Hold Time-out answering point extension into CDE Form 19, under "UCD Time-Out Routing For This Tenant".
- To permit a SUPERSET<sup>®</sup> set to be used as a Call Distribution Agent Position with a headset, select COS Option 205 (Call Distribution Agent Position) for the SUPERSET<sup>®</sup> set.

### Operation

For operation of recording devices and answering machines, refer to the particular manufacturer's instructions.

#### 4.91 VACANT NUMBER INTERCEPT

##### Description

Calls to programmed, but unassigned (vacant) access codes or extension numbers can be routed to a given answering point for completion. This point can be an LDN position on the Attendant Console (see ATTENDANT LDN KEYS) or any valid extension number. Vacant number intercept points can be programmed to be different or the same for DAY, NIGHT1, and NIGHT2 modes of system operation.

##### Conditions

If the required programming is not done, such calls will receive reorder tone.

##### Programming

To cause all calls to vacant numbers to be routed to a specific answering point, enter CDE Form 19 (Call Rerouting Table) to do the following:

- Enter the desired answering point access code, or extension number into the DAY column for the "Station Vacant Number Routing For This Tenant" Call Type.

##### Operation

None



#### 4.92 VARIABLE TIMERS

##### **Description**

The user can set the actual time-out period for each system timer.

##### **Conditions**

None

##### **Programming**

The various timers can be set via CDE Form 04 (System Options/System Timers).

Some timers are also in CDE Form 03 (COS Define).

See Section MITL9108-093-210-NA, Customer Data Entry for further information.

##### **Operation**

Refer to the specific feature.

### 4.93 VERIFIED ACCOUNT CODES

#### Description

Verified account codes allow a user to restrict feature, trunk and extension access by requiring that specific account codes be entered. This feature helps ensure accuracy for accounting purposes, and helps inhibit fraudulent use of DISA lines, outgoing trunks, etc. See also 'Verified Account Codes - DISA'.

#### Conditions

This feature is not available in software Generic 1000.

#### Programming

- Select System Option 05 (Verified Account Codes).
- Select the desired number of account code digits via System Option 44 (VARIABLE or 4 - 12 digits).
- Enter the verified account codes into CDE Form 32 (Account Code Entry) as required.
- Select COS Option 217 (Direct To ARS) for the station/trunk to allow the external number to be entered without the ARS leading digits (if this is desirable).
- Select the default ARS digits via Feature Access Code 36 (Direct To ARS).

#### Operation

To access the feature from an external line:

- Access the DPABX on a specified DISA trunk - two ringbacks are heard, followed by dial tone.
- Dial the DISA Account Code - if the account code verifies, dial tone is returned; if not, the trunk is dropped.
- Dial the external number.

---

#### 4.94 VERIFIED ACCOUNT CODES - (DISA)

##### Description

Verified Account Codes can be used to replace Access Codes. 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 rather than an Access Code. By using an Account Code, each DISA trunk can have access to its own COS Options.

##### Conditions

This feature is not available in software Generic 1000.

##### Programming

- See the programming under Direct Inward System Access (DISA).
- See programming steps under 'Verified Account Codes'.
- Select COS Option 810 (Special DISA) for the DISA trunk(s) to allow multiple DISA Account Codes.
- Select a value for the DISA answer timer via System Option 43 (DISA Answer Timer - 1 - 8 Seconds).

##### Operation

To access the system:

- Dial the required directory number from a DTMF telephone.
- Listen for two ringback bursts, followed by dial tone.
- Dial the DISA Access Code - dial tone is returned.

## 5. STATION FEATURES

5.01 This Part provides a description of the station features (rotary and DTMF sets) for the SX-200<sup>®</sup> DIGITAL PABX for software Generic 1000 and Generic 1001. For description of SUPERSET 3<sup>™</sup> and SUPERSET 4<sup>™</sup> features, refer to Sections MITL9108-093-106-NA and MITL9108-093-107-NA, respectively.

### 5.02 ABBREVIATED DIAL ACCESS

#### Description

This feature allows extension users to access systemwide preprogrammed directory numbers using abbreviated dialing.

#### Conditions

Reorder tone will be returned if the user enters an invalid abbreviated dial number.

#### Programming

Select COS Option 245 (Abbreviated Dialing Access) for the extension.

Assign an Access Code for Feature 24 (Abbreviated Dialing Access).

#### Operation

To dial an Abbreviated Dial number:

- Lift the handset – dial tone is heard.
- Dial the Abbreviated Dial access code.
- Dial the desired Abbreviated Dial number (one to three digits).

### 5.03 ACCOUNT CODE ACCESS

#### Description

An extension may have the option, or be forced to enter an account code for trunk calls. The account code may be one to 12 digits in length and will appear on all SMDR records. See Section MITL9108-093-451-NA, Station Message Detail Recording for further details.

#### Conditions

If the Account Code is of the 'Variable Length' type, the account code digits must be followed by a "#" (see below, Account Codes), except for the case where the digit length is 12.

A DTMF telephone must be used to enter account codes.

Rotary-dial type extensions will default to a digit length of 6, as they cannot enter the # character.

#### Programming

To force an extension user to use account codes for long distance calls, select COS Option 201 (Account Code, Forced Entry - Long Distance Calls) for the extension.

To force an extension user to use account codes always, select COS Option 200 (Account Code, Forced Entry - External Calls) for the extension.

Assign a feature access code to Feature 01 (Account Code Access).

#### Operation

To access a trunk via account code entry:

- Dial access code for account code entry.
- Dial account code digits (if System Option 05 - Account Codes Variable Length is selected, account code digits must be followed by a "#" to indicate end of account code) - dial tone is returned.
- Dial trunk access code (usually 9).
- Dial directory number - when the extension returns on-hook at the completion of the call, the SMDR record, including the account code, will be recorded.

## 5.04 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.)

An extension with the Broker's Call feature may access the 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.

### Conditions

COS Option 203 (Broker's Call) is mutually exclusive with the following:

- 302 (Flash-In Conference)
- 250 (Transfer with Privacy).

COS Options 214 (Cannot Dial a Trunk after Flashing) and 215 (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

Select COS Option 203 (Broker's Call) for the extension.

One or more of the COS Options 212 (Can Flash if Talking to an Incoming Trunk) or 213 (Can Flash if Talking to an Outgoing Trunk) may be selected in conjunction with Broker's Call.

### Operation

A normal 2-party call is established, and the extension user requires to consult a third party.

Flash the switchhook - transfer dial tone should be heard, and the second party is placed in consultation hold.

Dial the number of the third party and establish a private 2-party conversation.

To alternate between calls, flash the switchhook.

## 5.05 CALL FORWARDING – BUSY

### Description

This feature allows a user to have all calls that are directed to an extension, forwarded either to the Attendant, to a selected extension number within the system, to a hunt group, or to a selected external number (refer to EXTERNAL CALL FORWARDING) when the extension is busy. While the feature is active and the extension is idle, calls may be originated and received normally.

### Conditions

Callbacks will not be affected by this feature.

An extension in a hunt group with call forwarding in effect will be bypassed in the hunt group search.

Only one type of Call Forwarding can be applied to an extension at any one time. If a new code is entered, the previous code (if any) is replaced.

A call may be forwarded twice if the first forward is of the "Follow Me" or "Busy" type, and the second is of the "Don't Answer" type.

The feature is not effective if the forwarder has COS Option 234 (Never a Forwarder) in its COS.

Extension Call Forwarding takes precedence over system Call Forwarding.

### Programming

Select COS Option 206 (Call Forwarding – Busy) for the extension.

Assign an access code to Feature 03 (Call Forwarding – Busy).

Select COS Option 251 (Call Forward – Don't Answer Timer) to set the Call Forward Don't Answer time (two to six rings).

### Operation

To select Call Forwarding – Busy:

- Lift the handset – wait for dial tone.
- Dial the Call Forwarding – Busy access code.
- Dial the number to which calls are to be forwarded – dial tone returns.
- Hang up – the extension is available for normal use.



## Features Description

---

To cancel Call Forwarding – Busy:

- Lift the handset – wait for dial tone.
- Dial any Call Forwarding access code.
- Hang up – the call forwarding is cancelled.

## 5.06 CALL FORWARDING – BUSY/DON'T ANSWER

### Description

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

### Conditions

Callbacks will not be affected by this feature.

An extension in a hunt group with call forwarding in effect will be bypassed in the hunt group search.

Only one type of Call Forwarding can be applied to an extension at any one time. If a new code is entered, the previous code (if any) is replaced.

A call may be forwarded twice if the first forward is of the "Follow Me" or "Busy" type, and the second is of the "Don't Answer" type.

The feature is not effective if the forwarder has COS Option 234 (Never a Forwarder) in its COS.

Extension Call Forwarding takes precedence over system Call Forwarding.

### Programming

Select COS Options 206 (Call Forwarding – Busy) and 207 (Call Forward – Don't Answer) for the extension.

Assign an access code to Feature 05 (Call Forwarding – Busy/Don't Answer).

Select COS Option 251 (Call Forward – Don't Answer Timer) to set the Call Forward Don't Answer time (two to six rings).

### Operation

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

- Lift the handset – wait for dial tone.
- Dial the Call Forwarding – Busy/Don't Answer access code.
- Dial the number to which calls are to be forwarded – dial tone returns.
- Hang up – the extension is available for normal use.

## Features Description

---

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

- Lift the handset - wait for dial tone.
- Dial any Call Forwarding access code.
- Hang up - the call forwarding is cancelled.

## 5.07 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 a selected extension within the system, to the Attendant, to a hunt group, or to an external number. 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.

### Conditions

Callbacks will not be affected by this feature.

An extension in a hunt group with call forwarding in effect will be bypassed in the hunt group search.

Only one type of Call Forwarding can be applied to an extension at any one time. If a new code is entered, the previous code (if any) is replaced.

A call may be forwarded twice if the first forward is of the "Follow Me" or "Busy" type, and the second is of the "Don't Answer" type.

The feature is not effective if the forwarder has COS Option 234 (Never a Forwarder) in its COS.

Extension Call Forwarding takes precedence over system Call Forwarding.

### Programming

Select COS Option 209 (Call Forward – Follow Me) for the extension.

Assign an access code to Feature 06 (Call Forwarding – Follow Me).

Select COS Option 251 (Call Forward – Don't Answer Timer) to set the Call Forward Don't Answer time (two to six rings).

### Operation

To select Call Forwarding – Follow Me:

- Lift the handset – wait for dial tone.
- Dial the Call Forwarding – Follow Me access code.
- Dial the number to which calls are to be forwarded – dial tone returns.
- Hang up – the extension is available for normal use.

To cancel Call Forwarding - Follow Me:

- Lift the handset - wait for dial tone.
- Dial any Call Forwarding access code.
- Hang up - the call forwarding is cancelled.

## 5.08 CALL FORWARDING - I AM HERE

### Description

This feature allows an extension user to set up call forwarding for the user's extension from another extension.

### Conditions

Callbacks will not be affected by this feature.

An extension in a hunt group with call forwarding in effect will be bypassed in the hunt group search.

Only one type of Call Forwarding can be applied to an extension at any one time. If a new code is entered, the previous code (if any) is replaced.

A call may be forwarded twice if the first forward is of the "Follow Me" or "Busy" type, and the second is of the "Don't Answer" type.

The feature is not effective if the forwarder has COS Option 234 (Never a Forwarder) in its COS.

Extension Call Forwarding takes precedence over system Call Forwarding.

### Programming

Select COS Option 209 (Call Forward - Follow Me) for the extension.

Assign an access code to Feature 07 (Call Forwarding - I'm Here).

Select COS Option 251 (Call Forward - Don't Answer Timer) to set the Call Forward Don't Answer time (two to six rings).

### Operation

To select Call Forwarding - I'm Here:

- Lift the handset of another extension - wait for dial tone.
- Dial the Call Forwarding - I'm Here access code.
- Dial your own extension number - dial tone returns.
- Hang up - the extension is available for normal use.

To cancel Call Forwarding - I'm Here:

- Lift the handset of your own extension - wait for dial tone.
- Dial any Call Forwarding access code.
- Hang up - the call forwarding is cancelled.

## 5.09 CALL FORWARDING – DON'T ANSWER

### Description

This feature allows all calls directed to the extension that are not answered within a selected time to be forwarded to the Attendant, to a specified extension number, to a hunt group, or to an external number.

### Conditions

Callbacks will not be affected by this feature.

An extension in a hunt group with call forwarding in effect will be bypassed in the hunt group search.

Only one type of Call Forwarding can be applied to an extension at any one time. If a new code is entered, the previous code (if any) is replaced.

A call may be forwarded twice if the first forward is of the "Follow Me" or "Busy" type, and the second is of the "Don't Answer" type.

The feature is not effective if the forwarder has COS Option 234 (Never a Forwarder) in its COS.

Extension Call Forwarding takes precedence over system Call Forwarding.

### Programming

Select COS Option 207 (Call Forwarding – Don't Answer) for the extension.

Assign an access code to Feature 04 (Call Forwarding – Don't Answer).

Select COS Option 251 (Call Forward – Don't Answer Timer) to set the Call Forward Don't Answer time (two to six rings).

### Operation

To select Call Forwarding – Don't Answer:

- Lift the handset – wait for dial tone.
- Dial the Call Forwarding – Don't Answer access code.
- Dial the number to which calls are to be forwarded – dial tone returns.
- Hang up – the extension is available for normal use.

To cancel Call Forwarding – Don't Answer:

- Lift the handset – wait for dial tone.
- Dial any Call Forwarding access code.
- Hang up – the call forwarding is cancelled.

## 5.10 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.

Also see TRANSFER/CONSULTATION HOLD/ADD ON.

### Conditions

The Call Hold feature will not operate properly if either of the COS Options 224 (Flash For Attendant), or 223 (Flash Disable) are selected.

### Programming

Assign access codes to Feature Numbers: 21 (Call Hold), 22 (Call Hold Retrieve - Local), and 23 (Call Hold Retrieve - Remote).

Select COS Option 211 (Call Hold and Retrieve Access) for the extension.

Select COS Option 252 (Call Hold Recall Timer) to set the Call Hold recall time (1 to 5 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.



## Features Description

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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.

## 5.11 CALL PARK

### Description

This feature allows an extension user to park an active call and replace the handset. The call may be retrieved at the extension from at which the call was parked, or from any other extension in the system. If Music On Hold is employed by the system, the parked party will hear music. The parking extension may not originate new calls until the parked call is retrieved; however, paging equipment may be accessed.

### Conditions

- This feature is available only for users with 2500 or 500 sets; users with special sets (i.e., SUPERSET<sup>®</sup> sets) do not have Call Park access.
- This feature is not available in software Generic 1000.

### Programming

- Assign an access code to Feature Number 32 (Call Park).
- Select COS Option 401 (Call Park) for the extension.
- Select COS Option 252 (Call Hold Recall Timer) for the extension, to set the Call Park recall time.

### Operation

To park a call:

- Flash the switchhook; wait for dial tone.
- Dial the Call Park access code; wait for dial tone.
- Replace the handset, or access paging equipment (see Paging Access).

To retrieve a parked call from the original extension:

- Lift the handset – connection is made.

To retrieve a parked call from another extension:

- Dial the Call Park access code.
- Dial the parking extension number.

## 5.12 CALL TRANSFER

### Description

This feature allows an extension user, on an established call, to hold the call, then dial a third party, and transfer the second party to the third party.

### Conditions

The Call Transfer feature will not operate properly if any one of the COS Options 224 (Flash For Attendant), 223 (Flash Disable), or 203 (Broker's Call) are selected.

If the user is transferring a trunk, and the called party is a trunk, COS Options 214 (Cannot Dial a Trunk After Flashing) and 215 (Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk) apply to the holding extension.

### Programming

None

### Operation

To transfer a call to a second party:

- Flash the switchhook - transfer dial tone is returned, and the first party is in consultation hold.
- Dial another extension number - wait for ringing tone.
- Either go on-hook (call is transferred) or flash the switchhook again (3-party conference is initiated).

### 5.13 CALLBACK - BUSY

#### **Description**

This feature allows a user who has encountered a busy extension or trunk to set up a callback when the extension or trunk becomes idle.

#### **Conditions**

The called party must be busy.

Originate only stations do not have access to this feature.

Internal callbacks are automatically cancelled after 8 hours; ARS (trunk) callbacks are cancelled after 1 hour.

#### **Programming**

Assign an access code to Feature 20 (Callback - Busy).

Select COS Option 300 (Automatic Callback) for the extension.

If callbacks are to be permitted on outgoing trunks, select COS Option 236 (Outgoing Trunk Callback) for the extension.

#### **Operation**

To set callback on a busy extension or trunk; dial the callback - busy code while listening to busy tone - dial tone is returned.

The extension is now ready for normal use. When the busy extension or trunk becomes idle, your extension will ring - lift the handset, and the destination extension or trunk will ring.

## 5.14 CAMP-ON

### Description

When an extension user with the Camp-On feature reaches a busy extension, hunt group or trunk group and remains off-hook for 10 seconds, the extension is camped on to the busy equipment. At this time, busy tone is received and the called equipment receives 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 Attendant or an extension may also transfer a call into busy (camp the call onto a busy extension). In addition, by enabling COS Option 242 (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 hang up. The camped-on party (while busy) receives a double camp-on tone every 5 seconds until either the caller or the camped on party hangs up.

### Conditions

Camp-On tone is not applied to stations using paging equipment.

Extensions cannot camp on to paging equipment.

Extensions with COS Option 216 (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.

### Programming

Select COS Option 301 (Camp-On) for the extension.

If Camp-on is to be permitted on outgoing trunks, select COS Option 237 (Outgoing Trunk Camp-on) for the extension.

### Operation

To camp on:

- Dial the number - busy tone is returned.
- After 10 seconds of special busy tone, the called extension receives camp-on tone.
- The called 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.

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

## 5.15 CANNOT DIAL A TRUNK AFTER FLASHING

### Description

This COS feature prohibits the extension user from accessing a trunk after flashing the switchhook.

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.

### Conditions

This option does not apply to extensions with Broker's Call in their COS.

### Programming

Select COS Option 214 (Cannot Dial a Trunk After Flashing) for the extension.

### Operation

None

**5.16 CANNOT DIAL A TRUNK AFTER FLASHING (IF HOLDING OR IN CONFERENCE WITH A TRUNK)**

**Description**

This COS option prevents extensions from dialing a trunk call after flashing the switchhook, while another trunk is on hold.

**Conditions**

This option does not apply to extensions with Broker's Call in their COS.

**Programming**

Select COS Option 215 (Cannot Dial a Trunk After Flashing if Holding or in Conference with a Trunk).

**Operation**

None



### 5.17 CLEAR ALL FEATURES

#### Description

An extension user may cancel all call forwarding, do not disturb, and callbacks for that extension.

#### Conditions

None

#### Programming

Select COS Option 221 (Clear All Features) for the extension.

Assign an Access Code to feature 25 (Clear All Features).

#### Operation

To cancel all Call Forwardings, Callbacks and Do Not Disturb:

- Lift the handset – dial tone is returned.
- Dial the Clear All Features feature Access Code – dial tone is returned.
- Replace the handset.

## 5.18 DATA SECURITY

### Description

Any extension with Data Security in its COS cannot be overridden or receive Camp-On tone; it may be camped on to, but is secure against any form of audio intrusion.

### Conditions

The following COS Options must be disabled to permit correct operation of Data Security:

- COS Option 242 (Repeated Camp-On Beeps)
- COS Option 607 (Associated Modem Line).

### Programming

Select COS Option 216 (Data Security) for the extension.

### Operation

None

**5.19 DIAL CALL PICKUP**

**Description**

An extension can be assigned to a pickup group, and can answer any call for that group, by dialing the Dial Call Pickup access 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.

**Programming**

Assign an access code to Feature 08 (Dial Call Pickup).

See PICKUP GROUPS.

**Operation**

An extension in your pickup group rings.

Lift your handset - dial tone is returned.

Dial the Call Pickup code - the call is connected.

## 5.20 DIRECTED CALL PICKUP

### Description

Directed Call Pickup allows an extension user to answer any ringing telephone within the 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

Assign an access code to Feature 09 (Directed Call Pickup).

Select COS Option 218 (Directed Call Pickup) for the extension.

### Operation

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

## 5.21 DIRECT OUTWARD DIALING

### Description

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

### Conditions

Access restrictions to the trunks are controlled by COS Options.

Some Direct Outward Dialing may be restricted by Multi-Digit Toll Control (see Section MITL9108-093-213-NA, ARS/Toll Control).

### Programming

Program the 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.

Complete ARS programming – see AUTOMATIC ROUTE SELECTION.

### Operation

Lift the handset. Dial the ARS leading digits – CO dial tone is returned.  
Dial the required external number.

## 5.22 DISCRIMINATING DIAL TONE

### Description

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

### Conditions

None

### Programming

Select COS Option 219 (Discriminating Dial Tone) for the extension.

### Operation

None

### 5.23 DO NOT DISTURB

#### Description

This feature enables an extension user to place the extension in an apparent busy condition to all incoming calls, without affecting the outgoing features of the set (e.g., calls and feature activations can be made). Either the extension user or the Attendant can set up or cancel Do Not Disturb. The incoming calls to the extension may be routed to a predetermined answering point via call rerouting (see CALL FORWARDING). The Attendant can override Do Not Disturb from the console.

#### Conditions

All calls directed to the extension receive reorder tone or are intercepted to the Attendant.

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.

COS Option 220 (Do Not Disturb) must be enabled to set DO NOT DISTURB from the extension.

#### Programming

Select COS Option 220 (Do Not Disturb) for the extension.

Assign an access code to Feature 10 (Do Not Disturb).

#### 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.

---

## 5.24 EXTENSION CONFERENCE

### Description

This feature allows an extension user to set up a conference with up to five conferees (including the originating extension), without the assistance of the Attendant. 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. If the originator encounters a busy or unanswered extension number, the user 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

An extension is not permitted to bring an Attendant console into a conference.

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 transferred by an extension in a conference.

Only one party may flash out of the conference at a time.

COS Options 203 (Broker's Call) and 302 (Flash-in Conference) are mutually exclusive.

### Programming

Select COS Option 302 (Flash-in Conference) for the extension.

COS Options 212 (Can Flash if Talking to an Incoming Trunk), 213 (Can Flash if Talking to an Outgoing Trunk), 214 (Cannot Dial a Trunk after Flashing) and 215 (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).



## Features Description

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- 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.

---

## 5.25 EXTERNAL CALL FORWARDING

### Description

This feature allows an extension user to set up Call Forwarding to a number external to the PABX system, by storing the external number as an abbreviated dial entry, and using the entry as the number to which the caller is forwarded.

### Conditions

The extension must have at least one of the Call Forward options enabled, and also have access to one or more abbreviated dial tables in its Class of Service.

An extension with COS Option 200 (Account Code, Forced Entry – External Calls) 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 abbreviated dial table is used (SUPERSET<sup>®</sup> sets only).

The "Trunk-to-trunk connections" System Options control the type of connections allowed in External Call Forwarding.

Callers on ground start DISA trunks can be forwarded to an external call-forwarded extension. Loop start trunks of this type cannot be forwarded.

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 21 (Incoming to Outgoing Call Forward) is enabled, and if it is not loop start.

A handsfree extension may not be the calling extension, but can forward external calls.

DID or CCSA trunks may not be forwarded to an external call.

### Programming

Select COS Option 208 (Call Forwarding – External) for the extension.

Select COS Option 245 (Abbreviated Dialing Access) for the extension.

Select COS Options 206 (Call Forwarding – Busy), 207 (Call Forwarding – No Answer), and/or 209 (Call Forwarding – Follow Me) for the extension.

Select System Option 21 (Incoming to Outgoing Call Forward).

Assign access codes to Features: 3 (Call Forward - Busy), 4 (Call Forward - No Answer), 5 (Call Forward - Follow Me), 6 (Call Forward - Busy/Don't Answer) and 7 (Call Forward - I'm Here).

Select COS Option 313 (CO to CO Trunk Connect) to allow the Attendant 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 desired Call Forward Access Code.
- Dial the Abbreviated Dial Access Code.
- Dial the Abbreviated Dial Index 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 cancel External Call Forwarding at an Extension:

- Lift the handset - dial tone is returned.
- Dial the applicable Call Forward access code.
- Replace the handset - External Call Forwarding is now inactive.

## 5.26 FLASH DISABLE

### Description

An extension may be inhibited from using all services requiring the use of the switchhook flash.

### Conditions

COS Options 223 (Flash Disable) and 224 (Flash for Attendant) are mutually exclusive.

### Programming

Select COS Option 223 (Flash Disable) for the extension.

### Operation

None

## 5.27 FLASH FOR ATTENDANT

### Description

An extension can be set to automatically ring the Attendant 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/Conference/Add-On" or "Call Hold".

### Programming

Select COS Option 224 (Flash for Attendant) for the extension.

### Operation

While on an established call, flash the switchhook - the extension rings the Attendant Console; the other extension will be placed on consultation hold.

## 5.28 FLASH ON INCOMING TRUNK

### Description

When selected, this feature allows extension users to flash the switchhook while connected to an incoming trunk. This enables the trunk call to be transferred, held, or added to a conference.

### Conditions

This option will be disabled if the extension has COS Option 224 (Flash Disable) in its COS.

If the COS of an extension contains COS Option 224 (Flash for Attendant), flashing the switchhook results in the call being presented to the Attendant.

### Programming

Select COS Option 212 (Can Flash if Talking To An Incoming Trunk) for the extension.

### Operation

None

## **5.29 FLASH ON 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, or added to a conference.

### **Conditions**

This option will be disabled if the extension has COS Option 224 (Flash Disable) in its COS.

If the COS of an extension contains COS Option 223 (Flash for Attendant), flashing the switchhook results in the call being presented to the Attendant.

### **Programming**

Select COS Option 213 (Can Flash if Talking To An Outgoing Trunk) for the extension.

### **Operation**

None

### 5.30 GROUND BUTTON

#### **Description**

As an alternative to switchhook flash, users may wish to use a Ground Button. The Ground Button is pressed and released to access any service requiring switchhook flashing.

#### **Conditions**

None

#### **Programming**

None

#### **Operation**

None



### 5.31 HOT LINE

#### **Description**

This feature enables a Manual Line to be set up as a Hot Line. Upon going off-hook, it will automatically dial a preprogrammed Abbreviated Dial number (internal or external).

#### **Conditions**

The extension must be programmed as a Manual Line.

The extension must have access to Abbreviated Dial, and External Call Forwarding (if it is to ring an external number).

The Attendant must program a "Call Forward - Follow Me" destination number for that extension (see Attendant Call Forward Setup and Cancel).

#### **Programming**

Select COS Option 228 (Manual Line) for the extension.

Select COS Option 209 (Call Forward - Follow Me) for the extension.

#### **Operation**

Lift handset; the Abbreviated Dial number will be dialed automatically.

## 5.32 HUNT GROUP ACCESS

### Description

A user can 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.

See HUNT GROUPS.

### Conditions

Hunt group access codes must be defined in CDE (Form 17).

### Programming

None

### Operation

Dial the appropriate hunt group's access code.

**5.33 INWARD RESTRICTION (DID)**

**Description**

An extension may be restricted to not receive calls directly from DID trunk calls.

**Conditions**

None

**Programming**

Select COS Option 226 (Inward Restriction - DID) for the extension.

**Operation**

None

### 5.34 MANUAL LINE

#### **Description**

An extension with this feature in its COS is routed directly to the Attendant upon going off-hook. The extension can receive calls, but all call originations must be made with the assistance of the Attendant.

#### **Conditions**

The extension does not receive dial tone, but will receive ringback tone.

Manual line service cannot be used with consoleless operation.

#### **Programming**

Select COS Option 228 (Manual Line) for the extension.

#### **Operation**

To originate a call, lift the handset to ring the attendant – request assistance.

**5.35 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**

Select COS Option 233 (Never a Consultee) for the extension.

**Operation**

None

### 5.36 NEVER A FORWARDEE

#### **Description**

Inclusion of this feature in an extension's Class Of Service (COS) prevents an extension from having any calls forwarded to it by another extension user. If an extension user attempts to forward a call to an extension with this option in its COS, the user will receive reorder tone or intercept to the intercept point.

#### **Conditions**

Calls directed to the extension by hunting are not affected by the selection of this feature.

#### **Programming**

Select COS Option 234 (Never a Forwardee) for the extension.

If forwarded calls are to be intercepted by the Attendant, see System Feature ILLEGAL ACCESS INTERCEPT.

#### **Operation**

None

### 5.37 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 upon going off-hook.

#### **Conditions**

None

#### **Programming**

Select COS Option 701 (No Dial Tone) for the extension.

#### **Operation**

None

---

## 5.38 NON-BUSY EXTENSION

### Description

An extension with this feature only appears to be busy under the following conditions:

- The non-busy extension user is receiving busy tone.
- The non-busy extension user is dialing.
- The non-busy extension user is in a 5-party conference.
- The non-busy extension is ringing.
- The non-busy extension is receiving ringback tone.

Otherwise all calls routed to that extension will either receive ringing tone or will barge in on the call. If the extension user having this feature is in a conversation with another user and a call is routed to the "non-busy extension", the third party will barge in on the conversation. Should a fourth user call the "Non-Busy Extension" number that user will barge in on the three parties. A maximum of five parties may be in the formed conference.

### Conditions

This feature conflicts with the following trunk connect features:

- COS Option 313 (CO Trunk To CO Trunk Connect)
- COS Option 314 (CO Trunk To Tie Trunk Connect)
- COS Option 315 (CO Trunk To DID Trunk Connect)
- COS Option 316 (Tie Trunk To Tie Trunk Connect)
- COS Option 317 (Tie Trunk To DID Trunk Connect)
- COS Option 318 (DID Trunk To DID Trunk Connect)
- COS Option 319 (Extension Non-CO Trunk To Trunk Connect)

### Programming

Select COS Option 243 (Non-Busy Extension) for the extension.

### Operation

None



**5.39 ORIGINATE ONLY**

**Description**

An extension with this Class Of Service (COS) option may originate calls, but cannot receive any calls dialed to its number unless they are forwarded from another extension. Calls dialed to this extension are intercepted and routed to the programmed rerouting point or are given 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**

Select COS Option 235 (Originate Only) for the extension.

**Operation**

None

## 5.40 OVERRIDE SECURITY

### Description

This option provides an extension with security against Executive Busy Override (see ATTENDANT BUSY OVERRIDE in this Practice, and "Override" in Sections MITL9108-093-106-NA, SUPERSET 3™ Set, and MITL9108-093-107-NA, SUPERSET 4™ Set).

### Conditions

The Attendant or a SUPERSET® Set user can override an extension with Executive Busy Override in its COS.

### Programming

Select COS Option 238 (Override Security) for the extension.

### Operation

None

### 5.41 PAGING ACCESS

#### Description

An extension can be permitted to access the paging equipment by dialing the required access code. Access may be restricted to any of the nine zones depending upon the access code dialed. 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 extension paging announcement may be overridden by the Attendant.

Paging amplifiers and loudspeakers are customer-provided equipment.

If the Attendant overrides an extension, the extension will receive busy tone.

#### Programming

Select one or more of the following COS Options for the extension:

- 303 Paging Zone 1 Access
- 304 Paging Zone 2 Access
- 305 Paging Zone 3 Access
- 306 Paging Zone 4 Access
- 307 Paging Zone 5 Access
- 308 Paging Zone 6 Access
- 309 Paging Zone 7 Access
- 310 Paging Zone 8 Access
- 311 Paging Zone 9 Access
- 312 Paging Default (0 Gives All Zones Enabled)

Assign access codes to Features 12 (Paging Access to Default Zone) and 13 (Paging Access to Specific Zones).

#### 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.

## 5.42 PRIORITY DIAL 0

### Description

A Priority Dial 0 call can be programmed to appear at the console as a special softkey prompt. This will indicate to the Attendant that a priority call requires assistance.

Priority Dial 0 calls may be routed to any valid answering point.

### Conditions

None

### Programming

"Priority 0" must be programmed into the console's LDN form (and given an access code) via CDE Form 08 (Attendant LDN Assignments).

Priority Dial 0 Routing must be programmed to correspond to an LDN access code via CDE Form 19 (Call Rerouting Table).

Select COS Option 239 (Priority Dial 0) for the required extension.

### Operation

None

### 5.43 PRIVACY DISABLE

#### Description

This feature, when selected, will permit the extension user of a SUPERSET<sup>®</sup> key line to barge in on (override) the key line in use by the SUPERSET<sup>®</sup> user. Also, the SUPERSET<sup>®</sup> user will not be permitted to override the key line when it is in use by the extension user. When the feature is not selected, the extension user of the SUPERSET<sup>®</sup> key line will be prevented from overriding the key line when in use by the SUPERSET<sup>®</sup> user. Reorder tone is returned in all cases where overriding is not permitted.

#### Conditions

This only applies to extensions which occupy SUPERSET<sup>®</sup> key lines. Refer to Sections MITL9108-093-106-NA, SUPERSET 3<sup>™</sup> Set, and MITL9108-093-107-NA, SUPERSET 4<sup>™</sup> Set for information on key lines.

#### Programming

To disable SUPERSET<sup>®</sup> key line privacy, select COS Option 240 (Privacy Disable) for the affected extension.

#### Operation

None

## 5.44 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 placed the call on hold by flashing.

### Conditions

If illegal calls are routed to the Attendant via CDE Form 19 (Call Rerouting Table), the extension will be forwarded to the Attendant if it goes off-hook to dial.

If used in conjunction with the Flash Disable feature, ALL types of call origination are blocked.

See NEVER A FORWARDEE and CALLBACK features.

COS Options 241 (Receive Only) and 216 (Contact Monitor) are mutually exclusive.

### Programming

Select COS Option 241 (Receive Only) for the extension.

### Operation

None

## 5.45 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 Options 203 (Broker's Call), 224 (Flash for Attendant) and 223 (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 calls may be made after holding the second party (subject to system and extension options).

Calls may not be transferred to the paging circuit.

Switchhook flashes are ignored when talking to the Attendant.

### Programming

To allow an extension to hold, add on, or transfer a call in which the second party is an outgoing trunk, select COS Option 213 (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 COS Option 212 (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 COS Option 215 (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 COS Option 214 (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 COS Option 249 (Transfer Dial Tone) is selected, transfer dial tone is returned.

COS Option 302 (Flash-in Conference) must be enabled to allow calls to be added to the conference.

### Operation

On an established call:

- Flash the switchhook – dial tone is returned; the first party is in consultation hold, and will hear music if provided.
- Dial the number of the destination extension (the second party) – ringing tone or busy tone is returned.
- When the second party answers – a private conversation is possible.
- Flash the switchhook – a 3-party call is established.
- Replace the handset – the held call is transferred to the called extension.
- When the original extension replaces the handset – the call is released.



## 5.46 TRANSFER DIAL TONE

### Description

Selection of this option returns transfer dial tone in place of regular dial tone when the extension flashes the switchhook to place an established call on Hold in order to 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 COS Option 249 (Transfer Dial Tone) for the extension.

### Operation

None

## 5.47 TRANSFER WITH PRIVACY

### Description

An extension user can converse privately with two extension users (one at a time) and then connect them by hanging up.

### Conditions

An extension with Transfer with Privacy may access the 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 Options 250 (Transfer with Privacy) is mutually exclusive with the following options:

- 302 (Flash-in Conference)
- 224 (Flash for Attendant)
- 223 (Flash Disable)
- 203 (Broker's Call)

An extension with COS Option 233 (Never a Consultee) may not be consulted.

COS Options 214 (Cannot Dial a Trunk After Flashing) and 215 (Cannot Dial a Trunk After Flashing If Holding or in Conference With a Trunk), do not apply to an extension with Transfer with Privacy.

### Programming

Select COS Option 250 (Transfer With Privacy) for the extension.

One or both of the following COS Options may be selected: 212 (Can Flash if Talking to an Incoming Trunk), or 213 (Can Flash if Talking to an Outgoing Trunk).

### 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.

## 5.48 TRUNK ANSWER FROM ANY STATION (TAFAS) DAY AND NIGHT

### Description

This feature, if included in an extension's Class Of Service (COS), allows the user to answer incoming calls appearing at the common alerting devices. The TAFAS 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

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.

Trunk day assignments may be made for Night Bells.

### Programming

Select one or more of the following COS Options for extensions to be permitted access to TAFAS:

- 246 (TAFAS Any Access)
- 247 (TAFAS Access - Tenant)
- 248 (TAFAS Access During Day Service).

Assign Access Codes to one, or both of the following features:

- 14 (TAFAS - Any)
- 15 (TAFAS - Local Tenant).

### Operation

To answer a TAFAS call (in the local Tenant group):

- When the alerting device is heard, lift the extension handset; dial tone is heard.
- Dial the TAFAS (Local Tenant) code.
- Incoming call is now connected to the extension.

To answer any TAFAS call:

- When the alerting device is heard, lift the extension handset; dial tone is heard.
- Dial the TAFAS (Any) code.
- Incoming call is now connected to the extension.

## 5.49 TRUNK CAMP-ON WARNING TONE

### Description

An incoming trunk call to a busy extension may camp on to the extension. A warning tone is sent to the extension user over the current call. The warning tone can be programmed to repeat every 5 to 15 seconds.

### Conditions

COS Options 242 (Repeated Camp-on Beeps) and 216 (Data Security) are mutually exclusive.

### Programming

Select COS Option 242 (Repeated Camp-on Beeps) for the extension.

Set the cycle time for the repeated beeps via COS Option 253 (Repeated Camp-On Beeps). The default setting is 10 seconds.

### Operation

Finish the current call; hang up, the camped-on trunk will ring the extension.

---

## 6. MAINTENANCE FEATURES

**6.01** All features provided by the SX-200<sup>®</sup> DIGITAL PABX which apply to Maintenance are described in the following paragraphs. Maintenance functions are performed at the RS-232 Maintenance Terminal, which can be any RS-232 80-character terminal. It is recommended that a terminal capable of interpreting the ANSI special character set be used.

Information presented on the maintenance terminal CRT includes:

- System date, system time
- Current system alarm level
- System identification number
- Maintenance data display area
- Command entry line
- Softkey labels (softkeys 1 to 5)
- Softkey labels (softkeys 6 to 0).

Maintenance functions may also be accessed from the Attendant Console. In this case, information presented on the four lines of the console LCD display includes:

- System date, system time
- Command entry line
- Softkey labels (F1-F5)
- Softkey labels (F6-F0).

When the console is used for Maintenance, the maintenance output data is displayed on the LCD.

For further information on the Maintenance Terminal, see Section MITL9108-093-351-NA, RS-232 Maintenance Terminal.

**6.02 ALARM LEDS**

**Description**

All SX-200<sup>®</sup> DIGITAL PABX peripheral cards (lines, trunks, receivers, etc.) have one red alarm indication LED. This is illuminated if a diagnostic test fails on the card, or the card is installed in the wrong, or non-programmed card slot.

**Conditions**

None

**Programming**

None

**Operation**

None

### 6.03 ALARM STATUS DISPLAY

#### Description

The Maintenance person can display the system alarm levels either in their entirety, or divided into their separate categories. The categories are:

- Lines
- Trunks
- DTMF Receivers
- PCM Channels.

#### Conditions

See Section MITL9108-093-353-NA, General Maintenance Information for details.

#### Programming

See Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for details.

#### Operation

To obtain a complete system alarms report, enter the following soft-keys:

- REPORTS
- SHOW
- ALARMS
- ALL
- ALL
- ENTER
- (MORE)

## 6.04 CONFIGURATION REPORT

### Description

The Maintenance person can display the system configuration (i.e., the physical arrangement and disposition of the major items), down to the level of modules on cards installed in the peripheral bays.

### Conditions

None

### Programming

The system configuration may be programmed in CDE Form 01 (System Configuration). See Section MITL9108-093-210-NA, Customer Data Entry for further details.

### Operation

To obtain a system configuration report, enter the following softkeys:

REPORTS  
SHOW  
CONFIG  
ALL  
ENTER  
(MORE)



## 6.05 COPY DISK

### Description

It is possible for the maintenance person to make a backup copy of the system software diskette using the system floppy disk drive.

### Conditions

- The new diskette must already contain the system software.
- If the system software on the new diskette is of a different version than that on the original diskette, the system must be reset using the new diskette before it can be used.

### Programming

None

### Operation

To copy a diskette, enter the following softkeys:

SYSTEM  
COPY  
DATABASE  
ENTER  
(wait for prompt, enter new disk)  
CANCEL

## 6.06 DEVICE STATUS REPORT

### Description

The Maintenance Person can display the status of any peripheral circuit or circuits by entering a command at the maintenance terminal. The information displayed includes: circuit location, circuit type, call processing state and maintenance state.

### Conditions

None

### Programming

None

### Operation

To obtain a status report on a line circuit, enter the following softkeys:

```
REPORTS
SHOW
STATUS
EXT-NUM
(enter the extension number of the line)
ENTER
```

See Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for further details.

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## 6.07 DIAGNOSTICS

### Description

The SX-200<sup>®</sup> DIGITAL PABX has a complete, comprehensive diagnostic package. The diagnostic set can be divided into three distinct categories: power-up diagnostics, background diagnostics, and directed diagnostics.

Power-up diagnostics test virtually all of the system's hardware, and are run only when the system is powered up or reset.

Background diagnostics are run continuously in the on-line environment, and cover all of the digital peripheral cards in the system, and all of the analog junctors.

Directed diagnostics are run on command from the maintenance terminal or console in the on-line environment, and cover most of the peripheral cards in the system.

### Conditions

See Section MITL9108-093-353-NA, General Maintenance Information for details.

### Programming

None

### Operation

To perform a directed test on an extension, enter the following soft-keys:

```
DIAGNOSTICS
TEST
EXT-NUM
(enter the extension number of the line)
ENTER
```

See Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for further details.

## 6.08 SYSTEM LOGGING FACILITY

### Description

The SX-200<sup>®</sup> DIGITAL PABX keeps a system event log on the system floppy disk. Each time the "maintenance state" (i.e., faulty, suspect, available) of a device changes, or a major event occurs (i.e., a card installed in the wrong slot), a log report is generated. These log reports are accessible from the maintenance terminal or console, where they can be read, printed, or deleted.

### Conditions

None

### Programming

None

### Operation

To read the contents of the system log, enter the following softkeys:

LOGS  
READ  
ALL  
ENTER  
(MORE)

See Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for further details.

## 6.09 REMOTE MAINTENANCE ADMINISTRATION AND TEST (RMATS) ACCESS

### Description

The RMAT System allows personnel at maintenance centres (off-user premises) to access the SX-200<sup>®</sup> DIGITAL PABX to obtain maintenance data or to make programming changes. It provides a means to identify alarm conditions and to perform Customer Data Entry, without visiting the user's premises.

Refer to Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for information on setting up a remote terminal.

### Conditions

None

### Programming

None

### Operation

All of the maintenance functionality is available at the remote site.

## 6.10 REMOVE FROM SERVICE, RETURN TO SERVICE

### Description

The Maintenance Person can remove a line, trunk, receiver circuit or analog junctor circuit from service to perform maintenance functions on it. Removing a circuit from service makes it inaccessible to call processing; it remains so until the Maintenance Person returns it to service.

### Conditions

None

### Programming

None

### Operation

To remove a circuit from service, enter the following softkeys:

DIAGNOSTICS  
MORE  
BUSY-OUT  
BAY/SLOT/CCT  
(enter bay, slot, circuit numbers)  
ENTER

To return a circuit to service, enter the following softkeys:

DIAGNOSTICS  
MORE  
RET-TO-SVC  
BAY/SLOT/CCT  
(enter bay, slot, circuit numbers)  
ENTER

See Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for further details.

## 6.11 SHOW, SET DATE

### Description

The Maintenance Person can show and set the system date from the maintenance terminal.

### Conditions

None

### Programming

None

### Operation

To show the system date, enter the following softkeys:

SYSTEM  
SHOW  
DATE  
ENTER

To set the system date, enter the following softkeys:

SYSTEM  
SET  
DATE  
(enter the desired date)  
ENTER

## 6.12 SHOW, SET SYSTEM TIME

### Description

The Maintenance Person can show and set the system time from the maintenance terminal.

### Conditions

CDE Form 04 (System Options/System Timers) contains System Feature 01 (24-Hour Clock), which may be toggled to choose between a 12-hour and a 24-hour clock. See Section MITL9108-093-210-NA, Customer Data Entry for details.

### Programming

See above.

### Operation

To show the system time, enter the following softkeys:

SYSTEM  
SHOW  
TIME  
ENTER

To set the system time, enter the following softkeys:

SYSTEM  
SET  
TIME  
(enter the desired time)  
ENTER



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### 6.13 TEST LINE FUNCTION

#### Description

The test line is wired to the test terminals on the maintenance panel. This line, in addition to normal extension facilities, has access to maintenance and testing features which allow service personnel to perform some maintenance functions by entering DTMF digits. The functions possible are:

Function	Access Code
Busy-Out Device	26 (BO)
Return Device To Service	77 (RS)
Test Device	83 (TD)
Test Junctor (PCM Path)	85 (TJ)
Direct Trunk Select	38 (DT)
Test Printer	87 (TP)
Dump Logs	35 (DL)
Copy Database	23 (CD)

Refer to Section MITL9108-093-353-NA, Maintenance Information for additional information.

#### Conditions

There must be a line card in Bay 2, Slot 1.

#### Programming

Assign an unrestricted COS to the Test Line.

Assign an access code to Feature 18 (Maintenance Function - Test Line and Console).

#### Operation

The operation of the Test Line is detailed in Section MITL9108-093-353-NA, General Maintenance Information.

## APPENDIX A

### GLOSSARY OF SX-200® DIGITAL TERMINOLOGY

**A.01** This glossary has been produced to assist Mitel personnel in becoming familiar with the terms used in the SX-200® DIGITAL PABX. It is not intended to be a complete listing, because many of the more well known terms in use already exist in various existing specifications, Mitel Practices and other similar documents.

#### **ABH**

See Average Busy Hour

#### **ABSBH**

See Average Busy Season Busy Hour

#### **A/D**

See Analog/Digital

#### **AIOD**

Automatic Identified Outward Dialing

#### **ASCII**

American Standard Code for Information Interchange. A code in common use, which was developed by the American Standards Association, for both synchronous and non-synchronous data transmission between DTE's. Characters consist of an 8-bit binary code and incorporate parity bits.

#### **ADL**

See Associated Data Line

#### **Abbreviated Dialing**

The Abbreviated Dial facility is provided to give users the ability to dial abbreviated speed call codes, which substitute for a systemwide list of frequently-called numbers. These numbers may be displayed, when required, at the attendant console.

#### **Absorbed Digits**

In certain call processing functions performed by the SX-200® DIGITAL PABX, it may be necessary to suppress the onward transmission of certain digits received in a dialed sequence of digits. This digit absorp-

tion is required for applications such as DID calls and ARS purposes. See also Digit Modification.

### **Account Codes**

Account codes are used with the SMDR facility of the SX-200<sup>®</sup> DIGITAL PABX in order to record trunk call details (for example, time and date of call, its duration, and the calling and called numbers involved), against a particular user or group of similar users of the system. Verified Account Codes allow restricted access to the system.

### **A/D Convertor**

See Analog/Digital

### **Analog/Digital (A/D)**

A term frequently used in transmission technology which implies the transformation of analog signals (such as normal telephone speech signals) into their equivalent digital data signals. The device in general use which accomplishes this transformation is termed an A/D Converter. The device which accomplishes the conversion of digital signals into their analog form (if required), is termed a D/A Converter.

### **Analog Transmission**

Analog transmission is the transmission of a continuously varying signal. For example in the transmission of speech, where the magnitude of the signal at any instant in the transmission path is proportional to the magnitude of the original input. This type of transmission is distinct from digital transmission in which the original input is encoded (see Codec, for example), and the resulting line signal is in digital form.

### **Answering Point**

An Answering Point is a device to which an incoming call is directed. It normally consists of a station set, an attendant console or a workstation; and under certain conditions an Answering Point may be a hunt group, a trunk, or a device such as a night bell, an answering machine or a recorder / announcer machine.

### **Application Processor**

A processor containing one or more application programs which meet a customer's particular needs, for example to meet the needs of a hospital, a governmental agency or a university environment. The processor is usually arranged to be accessed directly by an input/output device; but it may, for example, by means of suitable interface arrangements, be connected to the SX-200<sup>®</sup> DIGITAL PABX and be thus capable of access by suitable input/output devices which are also connected to the SX-200<sup>®</sup> DIGITAL PABX.

### **Application Program**

See Application Processor.

### **Associated Modem Line**

This term refers to a DTE connection, by means of a modem, to an SX-200<sup>®</sup> DIGITAL PABX and which has an associated telephone station set. The telephone set can be used as a standard station set connected to the PABX; but has the additional capability of connecting the DTE to another DTE, via modem, through the DPABX. This is done by using the set in the normal manner and dialing the required digits to obtain the data call.

### **Asynchronous Mode**

This term refers to data transmission, in which a transmitting device sends data in a word-by-word sequence; where the time element between each word (character) is indeterminate and is dependent upon external factors. The transmitted data has own start and stop elements, and thus controls the receiving device. See also Synchronous Mode.

### **Attendant**

The term applied to the person assigned to handle calls which appear at the attendant console.

### **Authorized Access Codes**

Access to the SX-200<sup>®</sup> DIGITAL PABX for programming, maintenance or administration purposes can be obtained only by first entering an authorized access code (username and password).

### **Autobaud Detection**

This feature of certain data communication equipment allows it to interpret, on the receipt of one or more data characters, the baud rate of a transmitting source, and set its own receive circuits to accommodate this baud rate. In the SX-200<sup>®</sup> DIGITAL PABX the feature is applicable to the Maintenance/CDE port which, during the initial setting up procedure, automatically adjusts its baud rate to match that of the terminal.

### **Automatic Route Selection**

Automatic Route Selection selects the optimum trunk route automatically when a call is made by a station user. This selection is based on many factors, including cost, user priority, the day and time of day.

### **Average Busy Hour (ABH)**

A term used in traffic analysis and used to calculate ABSBH.

**Average Busy Season Busy Hour (ABSBH)**

The hour calculated to have the highest average business day traffic load during the busy season.

**Battery and Ground Pulsing**

A method of signaling used on long lines, in which both wires use battery and ground at each end of the circuit. When signaling to the remote end of the trunk, the battery and ground connections are reversed, becoming opposing potentials at the remote end of the trunk and increasing the current supply to the trunk.

**Battery Tone**

See Side Tone.

**Blocking**

The term used to express the condition existing in a switching system when the immediate establishment of a call is impossible due to insufficient switching connections being available in the system at that time.

**CCS**

The unit used in Traffic Analysis to denote the traffic occupancy of a switched circuit in a PABX exchange. One CCS represents 100 call-seconds.

**CDE**

See Customer Data Entry

**COV**

See Control Over Voice

**CP**

Call Processing

**CPU**

Central Processing Unit

**Call Processing**

This is the software package which handles all aspects of the setting up of connections within the PBX.

### **Control Over Voice**

This facility is used by the SUPERSET 4<sup>TM</sup> station set to perform most of the signaling functions of the set. A 32 kHz carrier signal is modulated according to the control function, and is transmitted to or from the set on the same pair of wires used for the audio connection. The carrier frequency lies above the normal audio range of the set, and is therefore inaudible to the user.

### **Circuit Switch (CS)**

The SX-200<sup>®</sup> DIGITAL PABX Circuit Switch provides a 16 X 16 matrix of bidirectional switch links, with each link accommodating 32 channels, each of which can be used for a voice or data transmission. Through the circuit switch, any device may be connected to any other device in the system. It is located on the DX Module on the Main Control card.

### **Circular Hunting**

See Group Hunting

### **Class of Restriction (COR)**

A Class of Restriction controls the access which a station (or a trunk) has to trunk circuits. It performs functions similar to toll control and is programmable on a station (or trunk) basis.

### **Class of Service (COS)**

A Class of Service has a number of different feature options assigned to it. This Class of Service may be allotted to one or many stations, and enables these stations to have, or be denied, features which are available within the SX-200<sup>®</sup> DIGITAL PABX. Up to 64 COS's are available which allow a large number of different groups of station users to be programmed, each with differing feature characteristics.

### **Codec**

The COder-DECoder is a device used in digital switching and transmission systems, for coding analog signals (e.g. voice signals) into a digital format for onward transmission; and decoding a digital transmission to recover the original analog signal.

### **Codec/Filter**

The Codec/Filter chip used in the SX-200<sup>®</sup> DIGITAL PABX consists of a Codec, a filter and other elements. It forms part of the peripheral card, with the Codec portion performing the necessary A/D and D/A functions and the filter portion providing low pass filtering for the line transmission.

### **Connection Memory**

Part of the DX chip which is used to store the digital voice (or data) samples. These samples are stored and forwarded under the control of the MCC.

### **Consultation Hold (Soft Hold)**

This type of call hold facility is also termed soft hold and is a form of temporary hold. It is used to place a second party on hold, while the first party is speaking (consulting) with a third party, or otherwise wishes to temporarily isolate the second party from conversation.

### **Critical Alarm**

See Major Alarm.

### **Cross-Connect Field**

See Main Distribution Frame

### **Customer Data Entry (CDE)**

Customer Data Entry is the process employed when data, particular to a specific customer installation, is entered into the SX-200<sup>®</sup> DIGITAL PABX System. This data includes such things as numbering plan, ARS routings, trunk descriptors, etc. CDE is entered into the SX-200<sup>®</sup> DIGITAL PABX via the Maintenance/CDE terminal.

### **DCE**

See Data Communication Equipment

### **DIC**

See Digital Interface Card.

### **DID**

Direct Inward Dialing.

### **DIL**

Direct-In Line.

### **DOD**

Direct Outward Dialing.

### **DLIC**

See Digital Line Interface Circuit.

**DSP**

See Digital Signal Processor.

**DTMF**

Dual Tone Multifrequency Signaling.

**DTE**

See Data Terminal Equipment

**DX**

The term used in the SX-200<sup>®</sup> DIGITAL PABX to represent the expression "digital crosspoint" which is used as the fundamental switching element of the SX-200<sup>®</sup> DIGITAL PABX Circuit Switch. The Circuit Switch is composed of a large number of digital crosspoint switch elements in the form of DX chips, assembled on a plug-in Circuit Switch module.

**Data Communication Equipment**

Data Communication Equipment (DCE) is the term used to describe that equipment which is employed as an interface between a communications line and Data Terminal Equipment (DTE). In general this interface accepts the data communication signals and the necessary control signals, over an RS-232 line from the DTE, and transforms them into the appropriate signals which are required to be sent over the communications path to the distant DCE and DTE. These line signals usually consist of modulated tone signals. Tone signals demodulated by the DCE at the distant terminal are reconverted into the relevant data and control signals. The data circuit is commonly a duplex circuit, i.e. capable of operation in both directions simultaneously.

**Data Terminal Equipment**

Data Terminal Equipment (DTE) is terminal equipment usually consisting of a keyboard and video screen or printer, which is used to communicate with a variety of other equipment (i.e. another DTE or a computer).

**Default**

This term refers to the value assigned to a particular function, which most nearly represents the normal or standard value of the function. A typical default value used in the SX-200<sup>®</sup> DIGITAL PABX for example is a value of 1 minute allowed before an unanswered ringing extension times out. However this value may be changed from the default value, during CDE programming, to a value which lies between 1 and 5 minutes.



### **Digit Modification**

This expression refers to the process of restructuring a dialed sequence of digits received by the SX-200<sup>®</sup> DIGITAL PABX which effectively results in the production of a different sequence of digits. The revised sequence may have new digits added and/or digits deleted (absorbed), or certain digits in the original sequence may be repeated. This process is performed automatically by the SX-200<sup>®</sup> DIGITAL PABX and is thus transparent to the user. Digit Modification is used in Speed Dialing operation, tandeming of trunk circuits, in processing incoming DID calls, in processing calls in ARS and other applications.

### **Digital Interface Card**

This card interfaces the analog cards in the analog bays to the digital switching network (the Circuit Switch), and the rest of the system.

### **Digital Signal Processor (DSP)**

This is a single chip processor capable of both tone detection and tone generation. Located on the Main Control card, the DSP generates and detects all of the call progress and DTMF tones used by the SX-200<sup>®</sup> DIGITAL PABX.

### **Digital/Analog**

A term used in connection with the conversion of digital signals to equivalent analog signals. The original signals are usually in analog form and are converted from analog to digital signals for transmission purposes (see also Analog/Digital).

### **Digital Line Interface Circuit**

The Digital Line Interface Circuit (DLIC) is a Mitel chip, which is designed to handle 256 kbits/s data transmitted between the SX-200<sup>®</sup> DIGITAL PABX and high-speed digital synchronous DTEs (i.e, the Attendant Console).

### **E and M**

The term applied to a type of tie trunk, and also to the signaling method used for this and for other types of trunks. The term is derived from the use of the E and M leads, forming part of the trunk equipment, and taken respectively to denote the receive and transmit leads; the two leads being used to pass supervisory conditions over the trunk.

### **Forced Account Code**

The Forced Account Code feature requires that when it appears in a particular station's COS, the user at that station must dial a valid account code each time that an outgoing trunk call is made. If it is not entered the user will be denied access to the trunk. The account code will appear as part of the SMDR record.

### **Full Duplex**

A method of operation which allows simultaneous transmission from both ends of a communications link

### **Ground Button**

See Recall Button

### **Ground Start**

The term used to designate a particular type of trunk circuit, on which a ground condition is applied to the ring lead of the trunk when an outgoing call seizes the trunk.

### **Group Hunting**

Group Hunting is a feature which allows certain stations to be formed in groups so that incoming calls are directed to the group by dialing a master number. A group can be arranged as a:

- Circular group, in which case the stations are searched in a circular manner commencing with the called station.
- Terminal group, in which case the stations are searched starting at the first station and ending with the last station in the group.

### **Hard Hold**

Hard Hold is the term used when a station user, or an attendant, places another party on hold, and can then perform any of the functions which are normally available at the station (as opposed to Consultation Hold, which restricts the functions which can be performed).

### **Hot Repair**

This term is applied, when a system has the ability of allowing maintenance or repair action to be performed, without first removing power from the system.

### **Intelligent Terminal**

An Input/Output device, usually with a keyboard for input and a VDU for output, which has local storage and a processor enabling it to perform certain tasks independently.

### **Interconnection Restrictions**

Certain interconnections between stations and trunks, and between trunk and trunk circuits are not allowed for various reasons. These interconnections are prevented by setting appropriate parameters in the Device Interconnection Table which is programmed as part of the

SX-200<sup>®</sup> DIGITAL PABX CDE procedures. Calls made to trunk circuits are thus subject to the parameters in the Table.

### **Least Cost Routing**

Least Cost Routing is one of the functions of Automatic Route Selection and refers to the economical aspects of the ARS facility. In Least Cost Routing, the trunk circuits are programmed, with regard to the effects of the costs of the possible alternative trunk routings. In practice the customer may require the economical aspects to be subordinate to the overall traffic efficiency requirements of the System; for example, less costly trunk routes may be available, but offer too low a traffic grade of service for the customer's needs. Actual requirements may be subject to Traffic Analysis of the customer's needs.

### **Loop Start**

A form of signaling used by a certain type of CO trunk, which designates that type of trunk. It denotes an outgoing trunk circuit which is seized by the system placing a "loop" condition on the trunk.

### **Loop Tie Trunk**

The term applied to a tie trunk between PABX's, which is seized by the application of a "loop" condition on the trunk. Subsequent supervisory conditions may be determined by the presence/absence of the loop or by battery-reversal conditions.

### **MCC**

See Main Control Card

### **MDF**

See Main Distribution Frame

### **MPU**

Main Processing Unit - in the case of the SX-200<sup>®</sup> DIGITAL PABX, this refers to the 68000 CPU on the Main Control card.

### **Main Control Card (MCC)**

The Main Control Card is the main hierarchical intelligence of the SX-200<sup>®</sup> DIGITAL PABX. It contains the CPU (Central Processing Unit), DRAM (Dynamic Random Access Memory), disk interface elements, and is responsible for the overall operation of the machine (including call processing, record keeping, maintenance functions and system control functions).

### **Main Distribution Frame**

The Main Distribution frame (MDF) forms the interconnection point between the in-house PBX (for example the SX-200<sup>®</sup> DIGITAL PABX), and the internal and external cabling to the PBX. The MDF provides a convenient and flexible means of interfacing the cabling to the system. The MDF is also known as the Cross-Connect Field.

### **Maintenance Panel**

The Maintenance Panel of the SX-200<sup>®</sup> DIGITAL PABX performs a variety of functions, including the following:

- Allows access to the maintenance facilities via an RS-232 port, an RJ-11 jack, or banana plugs.
- Allows maintenance personnel to manually switch plane activities (where redundant systems are installed), and perform other maintenance activities.

### **Major Alarm**

One of three possible type of alarm priorities, which are the Minor, Major and Critical Alarms. As the names imply, fault conditions which may arise on the SX-200<sup>®</sup> DIGITAL PABX can be segregated into different categories of urgency, which are then subsequently handled according to the degree of urgency.

### **Message Subsystem**

The Message Subsystem is one of the subsystem blocks of the SX-200<sup>®</sup> DIGITAL PABX. It's function is to act as the main message collection and distribution facility for the system, and links the Main Controller with the intelligent entities at the peripheral level or below. In effect it is the "nervous" system of the SX-200<sup>®</sup> DIGITAL PABX, in that it passes messages and commands between the lowest and highest levels of the system.

### **Minor Alarm**

See Major Alarm

### **Mixed Station Dialing**

The SX-200<sup>®</sup> DIGITAL PABX caters to the use of both rotary dial and/or DTMF types of station sets installed on the system.

### **Multiple Consoles**

More than one attendant console may be installed on an SX-200<sup>®</sup> DIGITAL PABX System. The trunk groups can be arranged to terminate such that they can be accessed from all of the consoles, and any call can be answered from any console.

**Null Modem**

This item can take various forms, but its function is always the same; it enables connections to be made between two “modems” on a back-to-back basis. The main characteristic of the Null modem is to transpose the RS-232C S and R leads which interconnect the “modems”; otherwise the send (S) leads of the two “modem” will be connected together, as will the two receive (R) leads. A typical example of the use of a Null Modem is its employment, in the form of an adapter added to the RS-232C cable, when connecting a Dataset to a modem to form a Modem Element which is used in a Modem Hunt Group.

**ONS**

See On-Premises Stations

**OPS**

See Off-Premises Stations

**Off-Premises Stations**

Stations which are located at a considerable distance from the parent communication system, and require special circuit terminating arrangements at the PBX, are referred to as Off-Premises (OPS) stations.

**On-Premises Stations**

Stations which are installed on the same premises as the PBX, or which can operate satisfactorily with the PBX, when installed in adjacent premises without special circuit arrangements, are known as On-Premises (ONS) Stations.

**Overlap Outpulsing**

Overlap Outpulsing is a feature used in the SX-200<sup>®</sup> DIGITAL PABX when making trunk calls. It results in dial pulses (or tones) being outpulsed prior to the receipt of all required digits from the user, the purpose being to reduce the time needed to process the call.

**PCB**

Printed Circuit Board

**PCC**

See Peripheral Control Card

**PCM**

Pulse Code Modulation

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## PLID

**Physical Location IDentity** - the bay number, slot number, circuit number and sub-circuit number of a device. Eg. a DTMF Receiver circuit 'plid' might be: Bay 2, Slot 3, Circuit 2, Sub-circuit 1.

## Peripheral Control Card

This card controls the operations within the analog peripheral bays, and is under control of the Main Control card.

## Peripheral Equipment

Peripheral Equipments, with regard to the SX-200<sup>®</sup> DIGITAL PABX, is understood to be all those external equipments which are connected to the SX-200<sup>®</sup> DIGITAL PABX, such as stations, sets, trunks, attendant consoles, and maintenance terminals.

## Peripheral interface

Peripheral Interface cards are cards which provide the interface facilities between the external peripheral equipments, such as stations, trunks and attendant consoles. One of their prime functions is to convert the external analog inputs to the internal digital PCM signals (and conversely convert digital PCM to analog output).

## Power Fail Transfer

The System Fail Transfer feature allows selected stations of the System (or portions of the System, according to the type of outage), to be transferred to certain trunks. Such transfer action is accomplished automatically in the event of a failure of the main power supply. Transfer action is also accomplished on a "zone" basis in the event of power failure occurring, for example, on a peripheral shelf.

## RS-242C

A North American data interchange standard, issued by the Electronics Industries Association (EIA). The equivalent European standard is the W.24 specification.

## Recall Button

This refers to the push-button installed on certain types of telephone station sets, for the purpose of providing a ground condition to line, when the button is pressed. When used in conjunction with the SX-200<sup>®</sup> DIGITAL PABX, pressing the Recall button corresponds to a switchhook flash; for example, when a party is being placed on hold. The button is sometimes referred to as the Ground button.

### **Ring Lead**

The second wire of a telephone pair (the first being the Tip Lead), so named because it was originally connected to the "ring" of a telephone plug.

### **SMDR**

See Station Message Detail Recording

### **Scanner Card**

This card continuously scans all of the analog ports in the analog bays to detect signals which require processor action.

### **Second Dial Tone**

A user making a trunk call through a PABX System normally receives dial tone after the handset is removed, and then dial tone from the CO after the trunk access code has been dialed. The **SX-200<sup>®</sup>** DIGITAL PABX however, with its ARS feature would mask the CO dial tone, because the outpulsing sequences are isolated from the user. To prevent confusion a second dial tone can be provided to the user (as a programmable option) by the **SX-200<sup>®</sup>** DIGITAL PABX, at the appropriate point in the outpulsing sequence.

### **Side Tone**

This is the portion of the transmitted voice signal that is returned to the receiver of the transmitting extension.

### **Soft Hold**

See Consultation Hold.

### **Station Message Detail Recording (SMDR)**

Station Message Detail Recording (SMDR) is a facility which records and prints out the details of incoming and outgoing trunk calls in the **SX-200<sup>®</sup>** DIGITAL PABX. Such details include the numbers of all parties involved in the call, the time and duration of each call, account codes and other pertinent details. Section **MITL9108-093-451** -NA, Station Message Detail Recording should be consulted for details of SMDR.

### **Stop Dial**

In tandem trunk operations it may be necessary, during the course of establishing a call, to suspend the dialing of dial train sequences. This is to ensure that no digits are lost, due to the next link in the tandem connection not being ready to receive the digits. The Stop Dial feature is employed to stop the outpulsing of further digits, by sending an on-hook condition to the originating end of the **circuit**.

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### Store and Forward Dialing

See Overlap Outpulsing

### Synchronous Mode

This term is associated with data which is transmitted in a continuous stream at a fixed rate, with the receiving terminal synchronized to the transmitting terminal by means of sync elements transmitted on a regular basis. See also Asynchronous Mode.

### System Configuration

The term System Configuration has a specific meaning for the SX-200<sup>®</sup> DIGITAL PABX, in that it refers to the particular hardware and software initially installed for the System. Any subsequent additions, deletions and any other changes which occurs results in a new System Configuration being created. The listing of hardware and software items which comprise the current System Configuration can be obtained on command from the maintenance terminal.

### System Fail Transfer

See Power Fail Transfer

### TCM

Transition Code Modulation.

### TTY

This abbreviation is in common use to denote a teletypewriter machine.

### Tandem Trunking

Tandem Trunking describes the facility of transparently switching co-located trunks together at the SX-200<sup>®</sup> DIGITAL PABX. This type of switching is subject to Digit Modification, and the parameters programmed during CDE for the Interconnection Restrictions table.

### Telco

The abbreviation used to denote Telephone Company.

### Tie Trunks

Tie Trunks **directly** interconnect two PABX systems together. This enables a station, terminated on one of the systems, to be **interconnected** to any other station, terminated on the other system. With Tandem Trunking the calling party can be extended through more than one node (PABX) of the network.



#### Tip lead

The first wire of a telephone pair, originally named because it was the lead connected to the "tip" of a telephone plug; the second wire of the pair being called the Ring Lead, as it was connected to the ring of the plug.

#### Toll Control

Toll Control, as applied in the SX-200<sup>®</sup> DIGITAL PABX, restricts the users to the use of certain trunk routes and denies the use of specific directory numbers. It forms part of the ARS feature, and each user is assigned a COR which, being associated with the trunk route tables in ARS, determines what degree of access the particular station has to the trunk network.

#### Tone Detector

Tone detection is a function provided by the Digital Signal Processor (DSP) to detect and analyse call progress and DTMF tones

#### UPS

Uninterruptable Power Supply.

#### VNL

See Via Net Loss

#### Via Net Loss (VNL)

This term is used in the transmission loss and level plans which are employed within the North American public and private telephone networks. The VNL plan automatically applies gain or attenuation (loss), at the switching node points, in a predetermined manner, to trunk and toll connections in the network. This has the result of providing an acceptable transmission grade of service to subscribers. See also Switched Digital Network Plan (SDNP) and MITL9108-093-180-NA, Engineering Information.

#### Wink Start

The Wink Start feature applies generally to tie trunk circuit operation. When an incoming trunk is seized it may be necessary to prevent the transmission of any digit sequences, until the incoming trunk equipment is ready to receive these digits. When the incoming trunk equipment is ready to receive the digits, a Wink Start condition is sent from the incoming end to the originating end of the trunk. The distant termination can now send digit sequences over the trunk. See also Delay Dial.

## APPENDIX B

## GENERIC 1000 AND GENERIC 1001 FEATURES

## SYSTEM FEATURE LIST

81.01 Table B1-1 outlines the feature differences between software Generic 1000 and software Generic 1001.

TABLE BI-1

Feature	Generic 1000	Generic 1001
Abbreviated Dial (System Speed Call)	✓	✓
Abbreviated Dial Entry via CDE Form		✓
Account Codes (nonverified)	✓	✓
Account Codes (verified)		✓
Alarm Indication (minor, major, critical)	✓	✓
Associated Modem Line		✓
Attendant Automatic Call Forward No Answer	✓	✓
Automatic Diagnostics	✓	✓
Automatic Route Selection (ARS)	✓	✓
Call Rerouting Tables	✓	✓
Class-of-Service (COS)	✓	✓
Class-of-Restriction (COR)	✓	✓
Conflict Dialing	✓	✓
Consoleless Operation	✓	✓
Contact Monitor	✓	✓
Customer Programming and Security	✓	✓
Customer Data Entry (CDE)	✓	✓
CDE Separate Access		✓
Backup and Restore	✓	✓
Customer Database Printouts		✓
Data Demultiplexor	✓	✓
Default Customer Data	✓	✓
Dial Access to Attendant	✓	✓
Dialing Plan	✓	✓
Dictation Trunks	✓	✓
Direct-In Lines (DILs)	✓	✓
Direct Inward Dialing (DID)	✓	✓
DID with Intercept to Recording		✓
DID Trunk Support		
- Control Shelf		✓
- Peripheral Shelves	✓	✓
Direct Inward System Access (DISA)	✓	✓
Discriminating Ringing	✓	✓
DTMF to Rotary Conversion	✓	✓
E&M Trunk Support		
-Control Shelf		✓
-Peripheral Shelves	✓	✓

TABLE B1-1 (CONT'D)

Feature	Generic 1000	Generic 1001
Extension Transfer Security	✓	✓
Fixed Night Service	✓	✓
Flexible Night Service	✓	✓
Flexible Numbering Plan	✓	✓
Hang Up Priority	✓	✓
Hunt Groups	✓	✓
Immediate Ring	✓	✓
Inhibit Automatic Supervision	✓	✓
Limited Wait for Dial Tone	✓	✓
Line Lockout Alarm	✓	✓
Message Waiting with Printouts	✓	✓
Multi-Attendant Positions	✓	✓
Multiple Trunk Groups	✓	✓
Music on Hold	✓	✓
Night Bells	✓	✓
Night Service Switching	✓	✓
Node Identification		✓
OPS Line Support		✓
Paging Access	✓	✓
Range Programming	✓	✓
Remote Maintenance	✓	✓
Resale Package		✓
· Ringing Time-out	✓	✓
Rotary to DTMF Conversion	✓	✓
Station Message Detail Recording (SMDR)	✓	✓
SUPERSET support		
-128 max.	✓	
-158 max.		✓
Switchhook Flash Timer Options	✓	✓
System Identifier	✓	✓
Tenanting	✓	✓
Test Line Maintenance Access	✓	✓
Toll Control (Multi-Digit)	✓	✓
Tone Demonstration Package	✓	✓
Tone-to-Pulse Conversion	✓	✓
Traffic Measurement	✓	✓
Trunk Answer from Any Station (TAFAS) Day and Night	✓	✓
Trunk Camp-on Warning Tone	✓	✓
Trunk Group Labels		✓
Trunk Interconnection (CDE Forms)		✓
Uniform Call Distribution (UCD)		✓
Vacant Number Intercept to the Attendant	✓	✓
Variable Timers (fully programmable)	✓	✓
Verified Account Codes		✓

ATTENDANT FEATURE LIST

TABLE B1-2

Feature	Generic 1000	Generic 1001
Alarm Readout	✓	✓
Automatic Wake-up		
Bell Off	✓	✓
Busy Override	✓	✓
Call Blocking		
Callback Busy/No Answer	✓	✓
Call Forward Setup and Cancel	✓	✓
Call Selection: LDN Keys, Recall, Dial 0	✓	✓
Call Selection of Priority Dial 0	✓	✓
Called/Calling Name, Number, COS and COR Display	✓	✓
Call Splitting	✓	✓
Call Swapping	✓	✓
Calls Waiting Display	✓	✓
Camp-on	✓	✓
CO Trunk to Non-CO Trunk Connect	✓	✓
Date Display	✓	✓
Direct Trunk Select	✓	✓
DISA Code Setup Enable	✓	✓
Display of SUPERSET Messages	✓	✓
DND Setup and Cancel	✓	✓
English Console		
Extension Busy-out	✓	✓
Flash over Trunk	✓	
French Console Operation		✓
Guest Room Features		
Hold Slots	✓	✓
Individual Directory Number	✓	✓
Inter-position Calling and Transfer	✓	✓
Last Number Redial	✓	✓
Liquid Crystal Display	✓	✓
Message Registration		✓
Message Register Printout		✓
Message Waiting Printout		✓
Message Waiting Setup and Cancel	✓	✓

TABLE B1-2 (CONT'D)

Feature	Generic 1000	Generic 1001
New Call Tone	✓	✓
Night/Day Switching	✓	✓
Non-CO Trunk to Non-CO Trunk Connect Override	✓	✓
Page Access	✓	✓
Paged Hold Slot Access	✓	✓
Programmable LDN Keys	✓	✓
Room Status		✓
Room Status Printout		✓
Ringer Volume Control	✓	✓
Serial Call	✓	✓
Soft-Function Keys	✓	✓
Station Busy-out	✓	✓
Time Display	✓	✓
Timed Recall	✓	✓
Training Jack	✓	✓
Tone Signaling		✓
Trunk Busy-out	✓	✓
Trunk Group Busy Display		✓
Trunk-to-Trunk Connect	✓	✓
Wake-up, Automatic with Printout		✓



TABLE B1-3 (CONT'D)

Feature	Generic 1000	Generic 1001
Pickup Groups	✓	✓
Priority Dial 0	✓	✓
Receive Only	✓	✓
Reset	✓	✓
Speed Call	✓	✓
Transfer, Consultation Hold/Add On	✓	✓
Transfer Dial Tone	✓	✓
Transfer with Privacy	✓	✓
Trunk Answer From Any Station (TAFAS)	✓	✓

## SUPERSET FEATURE LIST

TABLE B1-4

Feature	Generic 1000	Generic 1001
Account Code Access	✓	✓
Add Held	✓	✓
Advisory Messages	✓	✓
ARS Most Expensive Route Warning Message	✓	✓
Auto-Answer	✓	✓
Background Music	✓	✓
Busy and Hold Indications	✓	✓
Call Announce	✓	✓
Call Duration Display	✓	✓
Call Forwarding Setup and Cancel with Indication	✓	✓
Call Forwarding Indicated on Calls Made and Incoming Calls	✓	✓
Call-Me-Back Messages	✓	✓
Call Hold (via hold button)	✓	✓
Call Hold Retrieve (via pressing line key)	✓	✓
Call Split	✓	✓
Call Swap	✓	✓
Called/Calling Party Identification	✓	✓
Callback (Busy and No Answer)	✓	✓
Camp-on	✓	✓
Camped-on Party Identification	✓	✓
Cancel	✓	✓
Date/Time Display	✓	✓
Delay Ring Line Appearances	✓	✓
Display Function	✓	✓
Do Not Disturb Setup and Cancel with Indication	✓	✓
End-to-End Signaling	✓	✓
English and French	✓	✓
Executive Busy Override	✓	✓
Handsfree Operation	✓	✓
Help Function	✓	✓
Immediate Line Selection	✓	✓
Immediate Ring Line Appearances	✓	✓
Last Number Redial	✓	✓
Loop Test	✓	✓
Me&ages Waiting Indication	✓	✓
Microphone On/Off	✓	✓



TABLE 51-4 (CONT'D)

Feature	Generic 1000	Generic 1001
Multiline Appearance (key line and multiple call)	✓	✓
Music on Camp-on/Hold	✓	✓
Name Function	✓	✓
New Call Tone	✓	✓
Night Answer (TAFAS)	✓	✓
Night Switching (for Tenants)		✓
No Ring Line Appearances	✓	✓
Overriding Party Identification	✓	✓
Paging Access (all zones)	✓	✓
Pickup	✓	✓
Prime Line	✓	✓
Privacy Release	✓	✓
Ringer Tone Adjustment	✓	✓
Ringer Volume Control	✓	✓
Room Status Display		✓
Speaker On/Off	✓	✓
Speaker Volume Control	✓	✓
Speed Call Keys	✓	✓
Speed Call Feature Codes		✓
Sub-Attendant Recall	✓	✓
Swap Camp-on	✓	✓
Timed Reminder	✓	✓
Transfer/Conference	✓	✓
User Programmable	✓	✓

## APPENDIX C

### SUMMARY OF CALL TYPES FOR CALL REROUTING

CI.01 The following describes all of the 'call types' found in the call rerouting table. See CALL REROUTING.

#### CALL TYPE

##### Station Dial 0 Routing -

Any extension which dials the extension general attendant access code (0) will be routed here. This is based on the caller's tenant.

##### Priority Dial 0 Routing -

Any extension which dials the extension general attendant access code (0) and has PRIORITY DIAL 0 in its COS will be routed here. This is based on the caller's tenant.

##### DID Recall Point on Busy -

A DID call reaching a busy extension or hunt group will be routed here. This is based on the destination tenant.

##### DID Recall Point No Answer -

A DID call reaching an extension which does not answer will be routed here. This is based on the destination tenant.

##### DID Routing for Calls into this Tenant -

All DID calls normally routed to extensions will be routed here to allow screening of DID calls. This is based on the destination tenant.

##### DID intercept Routing for Calls into this Tenant -

A DID call to an illegal number will be routed here. This is based on the DID's tenant.

##### DID Vacant Number Routing for this Tenant -

A DID call to a vacant number will be routed here. This is based on the DID's tenant.

##### DID Attendant Night Access Points -

A DID call to the attendant while the system is in NIGHT service will be routed here. This is based on the DID's tenant.

##### Non-Dial-In Trunks Alternate Recall Points -

Non-Dial-In trunks that have waited for a busy or non-answering extension for the pre-determined recall time will be routed here. This is based on the destination tenant.

##### Dial-In Tie Recall Point on Busy -

A Dial-In Tie call reaching a busy extension will be routed here. This is based on the destination tenant.

**Dial-In Tie Recall Point on No Answer =**

A Dial-In Tie call reaching an extension which does not answer will be routed here. This is based on the destination tenant.

**Dial-In Tie Routing for All Calls into this Tenant =**

All Dial-In Tie calls normally routed to extensions will be routed here to allow screening of Dial-In Tie calls. This is based on the destination tenant.

**Dial-In Tie Intercept for Calls into this Tenant =**

A Dial-In Tie call to an illegal number will be routed here. This is based on the Tie trunks tenant.

**Dial-In Tie Vacant Number Routing for this Tenant =**

A Dial-In Tie call to a vacant number will be routed here. This is based on the Tie trunk's tenant.

**Dial-In Tie Attendant Access Night Points =**

A Dial-In Tie call to the attendant while this system is in NIGHT service will be routed here. This is based on the Tie trunk's tenant.

**Do Not Disturb Intercept Routing for this Tenant =**

An extension with Do Not Disturb activated will have its incoming calls routed here. This is based on the extension's tenant.

**Automatic Wake-up Routing for this Tenant =**

All extensions (not SUPERSET 4™ sets) answering a wakeup call will be routed here. Normally this will be a recording group. This is based on the extension's tenant.

**UCD Recording Routing for this Tenant =**

Incoming calls destined for UCD Agents are routed here when all of the Agents are busy. This would normally be a recording group. See UNIFORM CALL DISTRIBUTION.

**UCD on Hold Time-out Routing for this Tenant =**

Incoming calls to busy UCD hunt groups **which are not** answered after a pre-determined time-out period are routed here. See UNIFORM CALL DISTRIBUTION.

**DISA Day Service Routing for this Tenant =**

Direct Inward System Access (DISA) calls are routed here. This is based on the DISA trunk's tenant.

**Station Vacant Number Routing for this Tenant =**

Any station dialing a vacant number will be routed here. This is based on the extension's tenant.

**Station Illegal Number Routing for this Tenant =**

Any station dialing an **illegal** number will be routed here. This is based on the extension's tenant.

**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
ORDERING INFORMATION**

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CONTENTS	PAGE
1. INTRODUCTION . . . . .	I-I
Reason for Reissue . . . . .	I-I
2. ORDERING INFORMATION . . . . .	2-1
Warranty . . . . .	2-1
Spares Level . . . . .	2-1

LIST OF TABLES

TABLE	TITLE	PAGE
2-1	Basic System Equipment - 336-Port Configuration . . . . .	2-2
2-2	Expansion Kits - 336-Port Configuration . . . . .	2-2
2-3	Digital Peripheral Cards . . . . .	2-3
2-4	Spares - 336-Port Configuration . . . . .	2-3
2-5	Basic System Equipment - 480-Port Configuration . . . . .	2-4
2-6	Expansion Kits - 480-Port Configuration . . . . .	2-5
2-7	Upgrade Kit . . . . .	2-6
2-8	Analog Peripheral Cards . . . . .	2-6
2-9	Spares - 480-Port Configuration . . . . .	2-7
2-10	Peripheral Equipment . . . . .	2-8
2-11	Documentation . . . . .	2-9

**1. INTRODUCTION**

**1.01 This Section contains the ordering information for the SX-200<sup>®</sup> DIGITAL Private Automatic Branch Exchange (PABX).**

**Reason for Reissue**

**1.02 This document is reissued to provide hardware and software orderable part numbers for the SX-200<sup>®</sup> DIGITAL PABXs, with Generic 1000 and Generic 1001 software. Both the 336-port fully digital configuration and the 480-port configuration are described.**

---

## 2. ORDERING INFORMATION

- 2.01 The ordering information is divided into the following tables:
- Table 2-1 lists the components of the 336-port configuration.
  - Table 2-2 lists expansion kits for the 336-port configuration.
  - Table 2-3 lists all digital cards and modules required to complete the customer requirements.
  - Table 2-4 lists spares for the 336-port configuration.
  - Table 2-5 lists the components of the 480-port configuration.
  - Table 2-6 lists expansion kits for the 480-port configuration.
  - Table 2-7 lists the upgrade kit.
  - Table 2-8 lists all analog cards required to complete the customer requirements.
  - Table 2-9 lists spares for the 480-port configuration.
  - Table 2-10 lists all peripheral equipment.
  - Table 2-11 lists the system documentation

### Warranty

2.02 The MITEL SX-200<sup>®</sup> DIGITAL communications system is warranted against defective material and workmanship. Equipment requiring service or repair during the warranty period must be packaged in accordance with Section MITL9108-093-200-NA, Shipping, Receiving, and Installation Information, and returned prepaid to the supplier. Repaired or replacement equipment is returned to the customer, post prepaid by MITEL.

### Spares Level

2.03 MITEL recommends that a minimum spares level of 10% of installed systems, including 10% sparing of the basic system, be maintained. The sparing recommended for the Memory Module is 5%. This means that service personnel can carry a complete spare system on field trips, and therefore, if required, replace a complete system.

**TABLE 2-1  
BASIC SYSTEM EQUIPMENT - 336-PORT CONFIGURATION**

Marketing Name	Part Number	Comments
SX-200 <sup>®</sup> DIGITAL Basic System	9109-000-000-NA	SX-200 <sup>®</sup> DIGITAL Cabinet Control Shelf Cardfile and Backplane Bay Power Supply Floppy Disk Drive Blank Rear Door with fans; Main Control Card 6 CCT PFT Card and Cable
Attendant LCD Console	9108-007-000-NA	
SX-200 <sup>®</sup> Generic 1001 336-Port Software	9109-518-000-NA	Three Floppy Diskettes (including 1 spare) Decryption Module System Documentation

**TABLE 2-2  
EXPANSION KITS - 336-PORT CONFIGURATION**

Marketing Name	Part Number	Comments
Peripheral Bay Kit (with shelf)	9109-046-000-NA	Peripheral Shelf Peripheral Backplane Bay Control Card Blanking Panel PCM Cable
Peripheral Bay Kit (without shelf)	9109-047-000-NA	Peripheral Backplane Bay Control Card Bay Power Supply PCM Cable
PFT KIT	9109-030-000-NA	6-Circuit Power Fail Transfer card
LS/GS Conversion Module	9109-043-000-NA	Converts six Circuits from Loop Start to Ground Start
Bay Power Supply	9109-008-000-NA	Required when expanding into Bay 1



**TABLE 2-3  
DIGITAL PERIPHERAL CARDS**

Marketing Name	Part Number	Comments
ONS Line Card (12 Circuit)	9109-010-000-NA	for Rotary and DTMF sets
COV Line Card	9109-020-000-NA	6 COV Circuits per card
OPS Line Card	9109-040-000-NA	6 OPS Circuits per card
LS/GS Trunk Card	9109-011-000-NA	6 CO Trunk Interfaces
DID Trunk	9109-031-000-NA	6 DID Circuits per card
Universal Card	9109-005-000-NA	supports: <ul style="list-style-type: none"> <li>- E&amp;M Trunk Module</li> <li>- Music On Hold/Pager Module</li> <li>- Receiver/Relay Module</li> <li>- Console Module</li> </ul>
Receiver/Relay Module	9109-016-000-NA	4 DTMF Receivers 2 General Purpose Relays
Music On Hold/Pager Module	9109-018-000-NA	Music Input Paging Preamp Output Relay to control external amplifier
Console Module	9109-025-000-NA	Console Interface
E&M Trunk Module	9109-013-000-NA	E&M Trunk Circuit per Module

**TABLE 2-4  
SPARES - 336-PORT CONFIGURATION**

Marketing Name	Part Number	Comments
Control Shelf Assembly	9108-014-000-NA	
Spare PCM Cable	9109-050-000-NA	
Peripheral Bay Shelf Assembly	9109-O 15-000-NA	
Peripheral Bay Backplane Assembly	9109-044-000-NA	
Spare Fan	9109-032-000-NA	
Replacement Filter	9109-037-000-NA	
Floppy Disk Drive Assembly	9109-124-000-NA	
Spare Diskettes Generic 1001 336-Port	9109-034-000-NA	3 Floppy Diskettes
Main Control Card	9109-003-000-NA	
Bay Control Card	9 109-O 17-000-NA	
Power Fail Transfer Card	9109-023-000-NA	6 Power Fail Transfer Circuits

Ordering Information

**TABLE 2-5  
BASIC SYSTEM EQUIPMENT - 480-PORT CONFIGURATION**

Market Name	Part Number	Comments
Basic System (Bay 1 & 2)	9108-000-001-NA	SX-200 <sup>®</sup> DIGITAL Cabinet Control Shelf Cardfile and Backplane Bay Power Supply Floppy Disk Drive Fan Assembly Blank Rear Door Main Control Card with DX and Memory
Basic System (Bay 1, 2, and 3)	9108-000-002-NA	SX-200 <sup>®</sup> DIGITAL Cabinet SX-200 <sup>®</sup> DIGITAL Power Supply Control Shelf <b>Cardfile</b> and Backplane Bay 3 Shelf and Backplane Bay Power Supply Fan Assembly Floppy Disk Drive Main Control Card Digital Interface Card Peripheral Control Card Scanner Card Bay 2-3 PCM Cable Interconnect Card and Cables Cutover Card (12 PFT CCTS) PFT Monitor Cable
Attendant LCD Console	9108-007-000-NA	
SX-200 <sup>®</sup> DIGITAL Generic 1000 Software	9108-518-100-NA	Three Floppy Diskettes (including 1 spare) Decryption Module System Documentation
SX-200 <sup>®</sup> DIGITAL Generic 1001 480-Port Software	9108-518-200-NA	Three Floppy Diskettes (including 1 spare) Decryption Module System Documentation

**TABLE 2-6**  
**EXPANSION KITS - 480-PORT CONFIGURATION**

Marketing Name	Part Number	Comments
Bay 3 kit	9108-012-000-NA	Bay 3 Shelf and Backplane SX-200 <sup>®</sup> DIGITAL Power Supply Bay 2-3 PCM Cable Fan Assembly Scanner Card Peripheral Control Card Bay 3 Hardware Kit Interconnect Card with Cables Digital Interface Card Bay 2-3 PCM Cable
Bay 4 Kit (Peripheral Cabinet)	9108-001-000-NA	SX-200 <sup>®</sup> DIGITAL Peripheral Cabinet SX-200 <sup>®</sup> DIGITAL Power Supply Bay 4 Shelf and Backplane Digital Interface Card Peripheral Control Card Scanner Card Bay 2-4 PCM Cable Bay 4 Hardware Kit Interconnect Card with Cables Cutover Card (12 PFT Circuits) and PFT Cables
Bay 5 Kit	9108-013-000-NA	Bay 5 Shelf and Backplane Digital Interface Card Bay 4-5 PCM Cable SX-200 <sup>®</sup> DIGITAL Address/Data Cables Set Bay 5 Hardware Kit
Control Cabinet PFT Kit	9108-030-000-NA	Optional when adding Bay 3 Kit to SX-200 <sup>®</sup> DIGITAL cabinet only. SX-200 <sup>®</sup> DIGITAL Cutover Card (12 PFT Circuits) PFT Cables

Ordering Information

**TABLE 2-7  
UPGRADE KIT**

Marketing Name	Part Number	Comments
SX-200 <sup>®</sup> DIGITAL Upgrade Kit, less Software	9108-029-001-NA	Control Cabinet (1 Shelf) SX-200 <sup>®</sup> DIGITAL Power Supply Bay Power Supply Floppy Disk Drive interconnect Card and Cables Cutover Card (12 PFT Circuits) Main Control Card with DX and Memory Digital Interface Card Peripheral Control Card Universal Card Console Module Receiver/Relay Module MOH/Paging Module LCD Console PCM Cables (Bay 2-4) (Bay 4-5)

**TABLE 2-8  
ANALOG PERIPHERAL CARDS**

Marketing Name	Part Number	Comments
E&M Trunk Card	9110-013-000-NA	
DID/TIE Trunk Card	9110-031-000-NA	
Scanner Card (1200 BAUD)	9110-104-000-NA	
Line Card (8-Station)	9110-110-000-NA	
CO Trunk Card	9110-211-000-NA	4-Circuit CO Trunk Card
SUPERSET <sup>®</sup> Line Card	9110-410-000-NA	8-Circuit SUPERSET 3 <sup>™</sup> and SUPERSEP 4 <sup>™</sup> Line Card

**TABLE 2-9  
SPARES - 480-PORT CONFIGURATION**

Marketing Name	Part Number	Comments
Control Shelf Assembly	9108-014-000-NA	
PCM Cable (Bay 2-3)	9108-025-000-NA	
PCM and Ground Cable (Bay 2-4)	9108-026-000-NA	
PCM Cable (Bay 4-5)	9108-027-000-NA	
PFT Monitor Cable	9108-028-000-NA	
Rear Door Fan Assembly	9108-032-000-NA	
Spare Fan	9109-032-000-NA	
Replacement Filter (Front Door)	9109-037-000-NA	
Floppy Disk Drive Assembly	9109-024-000-NA	
Spare Diskettes Generic 1000	9108-034-000-NA	3 Floppy Diskettes
Spare Diskettes Generic 1001	9108-034-001-NA	3 Floppy Diskettes
SX-200 <sup>®</sup> DIGITAL Power Supply 11 ov	91 IO-108-003-NA	
Digital interface Card	9108-002-000-NA	
Peripheral Control Card	9108-203-100-NA	

Ordering Information

TABLE 2-10  
PERIPHERAL EQUIPMENT

Marketing Name	Part Number	Comments
LCD Console	9108-007-000-NA	
LCD Console Lens and Label Kit	9108-036-000-NA	Keypad Label and Protective Lens
LCD Console French Conversion Kit	9108-040-000-CA	French Keypad Label French Attendant Console Guide
SUPERSET 3™ Set	9173-000-001-NA	Multi-feature 3-line Telephone
SUPERSET 3™ French Conversion Kit	9173-070-000-CA	25 Sets of French Labels and User Reference Cards
SUPERSET 3™ Label Kit	9173-002-000-NA	SUPERSET 3™ Protective Lens quantity: 10
SUPERSET 4™ Set	9174-000-005-GM	Full Feature Multiline Telephone
SUPERSET 4™ Set French	9174-000-002-CA	French SUPERSET 4™ Set
SUPERSET 4™ Label Kit	9174-002-002-NA	Telephone number and Line Identification labels. quantity: 25
SUPERSET 4™ Lens Kit	9174-002-003-NA	SUPERSET 4™ Protective Lens quantity: 10
SUPERSET 4™ Support Stand	9174-001-000-NA	Spare Stand for SUPERSET 4™ Set quantity: 8
Handset	9170-048-002-NA	Spare Handset for SUPERSET 3™ and SUPERSET 4™ Sets quantity: 10
Handset Cord	9170-048-001-NA	Spare Handset Cord for SUPERSET 3™ and SUPERSET 4™ Sets quantity: 10
SUPERSET® Line Cord Pack	9170-048-004-NA	Spare Line Cord quantity: 10
Static Protection Unit	9180-067-001-NA	Protects system against static discharges at stations. installed at distribution frame. One unit handles 25 stations.

TABLE 2-11  
DOCUMENTATION

Marketing Name	Part Number	Comments
SX-200 <sup>®</sup> DIGITAL Generic 1000/1001 Volumes 1 to 4	9108-035-001-NA	Contains Volumes 1-4 of Technical Documentation, which cover Generic 1000 and Generic 1001 features.
SX-200 <sup>®</sup> DIGITAL Generic 1000/1001 Volume 1	9108-092-001-NA	
SX-200 <sup>®</sup> DIGITAL Generic 1000/1001 Volume 2	9108-092-002-NA	
SX-200 <sup>®</sup> DIGITAL Generic 1000/1001 Volume 3	9108-092-003-NA	
SX-200 <sup>®</sup> DIGITAL Generic 1000/1001 Volume 4	9108-092-004-NA	
Attendant Console Guide	9108-090-010-NA	Details LCD Attendant Console Operation.
SX-200 <sup>®</sup> DIGITAL Generic 1000/1001 System Doc. French	9108-035-000-CA	Technical Documentation Volumes 1-4 (French)
French Attendant Console Guide	9108-090-010-CA	
LCD Console French Conversion Kit	9108-040-000-CA	French Keypad Label and French Attendant Console Guide
General Information Book	9110-952-026-NA	Includes an overall description of the SX-200 <sup>®</sup> DIGITAL PABX features and peripheral devices.

**SX-200" DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
AUTOMATIC ROUTE SELECTION AND TOLL CONTROL**



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CONTENTS	PAGE
<b>1. GENERAL</b> .....	<b>1-1</b>
Introduction .....	1-1
Reason for Reissue .....	1-1
ARS: General Description .....	1-1
<b>2. NUMBERING PLANS</b> .....	<b>2-1</b>
General .....	2-1
North American Numbering Plan .....	2-1
<b>3. CALL ROUTING OPTIONS</b> .....	<b>3-1</b>
General .....	3-1
Direct Distance Dialing .....	3-1
Tie Line Service .....	3-1
Foreign Exchange Service (FX) .....	3-1
Wide Area Telephone Service (WATS) .....	3-2
Specialized Common Carrier Service (SCC) .....	3-3
<b>4. DETAILED DESCRIPTION</b> .....	<b>4-1</b>
Introduction .....	4-1
Alternative Routing .....	4-1
Least Cost Routing .....	4-1
Toli Control .....	4-1
Overlap Outpulsing .....	4-2
Expensive Route Warning Tone .....	4-2
Callback Gueueing .....	4-3
Camp-on Queueing .....	4-3
Return Dial Tone .....	4-3
<b>5. ARS TABLES</b> .....	<b>5-1</b>
General .....	5-1
ARS COR Group Definition Table (CDE Form 26) .....	5-1
ARS Day Zone Definition Table (CDE Form 21) .....	5-2
ARS Modified Digit Table (CDE Form 22) .....	5-4
ARS Route Definition Table (CDE Form 23) .....	5-7
ARS Route Lists Table (CDE Form 24) .....	5-10
ARS Route Plans Table (CDE Form 25) .....	5-12
ARS Digit Strings Tables (CDE Form 26) .....	5-13
<b>6. ARS OPERATION: GENERAL APPROACH</b> .....	<b>6-1</b>
General .....	6-1
Programming Process - General .....	6-1
<b>7. APPLICATION</b> .....	<b>7-1</b>
General .....	7-1
Scenario .....	7-1
Trunk Groups .....	7-1
COR Assignments .....	7-2
ARS Form Filling .....	7-2
Step 1 .....	7-4
Step 2 .....	7-4
Step 3 .....	7-4

CONTENTS (CONT'D)

PAGE

ARS Digit Strings . . . . .	7-5
Route Definition Table . . . . .	7-9
Route List Table . . . . .	7-9
Route Plan Table . . . . .	7-9
Day Zone Table . . . . .	7-9
COR Group Definition Table . . . . .	7-10
Modified Digits Table . . . . .	7-10

**8. SYSTEM PROGRAMMING . . . . . 8-1**

LIST OF TABLES

TABLE	TITLE	PAGE
5-1	COR Group Definition Table . . . . .	5-3
5-2	ARS Day Zone Definition . . . . .	5-5
5-3	ARS Modified Digit Table . . . . .	5-7
5-4	ARS Route Definition Table . . . . .	5-9
5-5	ARS Route Lists Table . . . . .	5-11
5-6	ARS Route Plans Table . . . . .	5-13
5-7	ARS Digit Strings Table - Leading Digits . . . . .	5-16
5-8	ARS Digit Strings - Nested Table . . . . .	5-17

LIST OF ILLUSTRATIONS

FIGURE	TITLE	PAGE
3-1	Typical Tie Line . . . . .	3-2
3-2	Typical Foreign Exchange Line . . . . .	3-3
3-3	Canadian WATS Zoning . . . . .	3-5
3-4	Typical SCC Arrangement . . . . .	3-6
5-1	ARS Table Hierarchy . . . . .	5-2
7-1	Trunking Network . . . . .	7-3
7-2(a)	Table Network (Part 1) . . . . .	7-6
7-2(b)	Table Network (Part 2) . . . . .	7 - 7

## 1. GENERAL

### introduction

1.01 This Section contains a comprehensive description of the Automatic Route Selection (ARS) feature of the SX-200<sup>®</sup> DIGITAL PABX. Parts 2 and 3 provide the reader with background information on the North American Numbering Plan and on the routing options offered to PABX owners by telecommunications companies. A clear understanding of these parts is essential in order to fully implement ARS. The remainder of the document is dedicated to a detailed description of ARS, which concludes with a description of how an ARS plan is prepared on paper, with a scenario centering around a fictitious company.

### Reason for Reissue

1.02 This Section is reissued, to provide a description of the operation and available features of the SX-200<sup>®</sup> DIGITAL ARS/Toll Control package in Generic 1000 and Generic 1001.

### ARS: General Description

1.03 Within this practice references are made to "the customer", "the installation company", and "the user". These are defined as follows:

- **The customer** is the owner of the SX-200<sup>®</sup> DIGITAL PABX.
- **The installation company** is a company which is authorized by Mitel to sell and install SX-200<sup>®</sup> DIGITAL PABX. This company works closely with the customers to determine their requirements and then installs and programs the system accordingly.
- **The user** is a person who makes use of the facilities of the PABX through one of the system's peripheral devices (telephone sets).

1.04 When a trunk call is initiated from within a PABX there are a number of factors which govern its routing and connection. They are: (a) route availability, where a route is defined as a collection of similar trunks within a Trunk Group; (b) cost, when more than one route exists; and (c) caller's toll restriction (i.e., whether the caller is allowed to make such a call, and if so, on what routes).

1.05 ARS is a standard feature of the SX-200<sup>®</sup> DIGITAL PABX, deriving the answers to these questions automatically every time a trunk call is initiated, and routing the call accordingly. The process is totally transparent to the caller; no access code is required, and the process does not depend on a fixed numbering plan.

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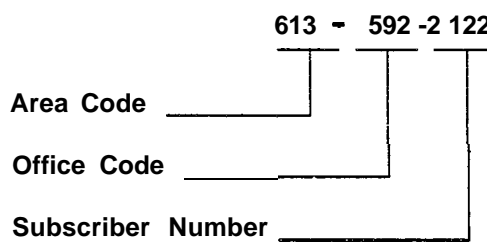
## 2. NUMBERING PLANS

### General

2.01 The ARS feature is universal, insofar as it is compatible with any numbering plan which may be employed by any public network. It is, however, necessary to understand the numbering plan of the public network which serves the PABX in order to make full use of the toll application of the ARS feature.

### North American Numbering Plan

2.02 The purpose of any numbering plan is to enable any subscriber in the network to be connected to any other subscriber in the network. When the North American numbering plan was introduced, subscribers were assigned a unique digit string comprising a maximum of 10 digits, compiled as follows:



2.03 The area code defines a geographic telephone area; the office code identifies a central office (CO) within the area; and the subscriber number identifies a subscriber of the CO.

2.04 It was possible to create a distinction between area and office codes by ensuring that the second digit of the area code was 1 or 0 and the second digit of the office code was any digit in the range 2 through 9. However, as the number of COs within each area grew, it became necessary to augment the supply of office codes by allowing the second digit of the code to be in the range 0 through 9. This produced a conflict between area and office codes, a conflict which was resolved by the introduction of the digit 1 as prefix to all area codes (e.g., 1-61 3-592-2122).

2.05 The prefix digit 1 has now been generally adopted as a toll prefix in large areas, where toll charges are incurred for calls made between offices in the same area (e.g., 1-256-2122).

2.06 In addition to the digit strings described above, there are sets of numbers which are reserved for special services, for example 411 for directory assistance. These numbers do not conflict with area or office codes.

2.07 The present North American numbering plan therefore comprises digit strings of one, three, seven, eight, and 11 digits. Some examples are:

## Automatic Route Selection and Toll Control

---

Operator	0
Service Number	411
Local Call	592-1111
Toll Call Within an Area	1-256-2222
Toll Call to Another Area	1-416-486-3333
Toll Call Within an Area (NO 1 prefix)	256-2222

### 3. CALL ROUTING OPTIONS

#### General

3.01 Telephone companies offer a number of different methods of routing calls over the public network (e.g., tie trunks, WATS lines), each of which has a different cost structure. Correct use of these trunks can provide substantial savings to the user.

3.02 To determine which routing options are best suited to any given PABX a traffic survey should be completed by the installation company prior to installation. The Traffic Measurement and Station Message Detail Recording features of the SX-200<sup>®</sup> DIGITAL PABX allow the use of these routes to be monitored once the system is installed, in order that they may be modified as traffic demands change.

3.03 The SX-200<sup>®</sup> DIGITAL PABX supports the following long distance services:

- Direct Distance Dialing (DDD)
- Tie Line
- Foreign Exchange
- Wide Area Telephone Service (WATS)
- Specialized Common Carrier (SCC).

#### Direct Distance, Dialing

3.04 Direct Distance Dialing allows telephone users to call subscribers within the home and international networks without the assistance of the operator. Connections are completed over standard trunk routes and are charged on a usage basis at a rate which varies with distance, time of day, and day of the week. DDD rates are given in the local telephone directory, or contact the local Telephone Company for rate information not listed in the directory.

#### Tie Line Service

3.05 Tie Line Service provides a "tie" between two PABXs. The charge for each tie line is a flat rate charge based on the airline mileage of the line. Figure 3-1 shows a typical tie line connection between an SX-200<sup>®</sup> DIGITAL PABX in Ottawa, and an SX-200<sup>®</sup> DIGITAL PABX in Toronto.

#### Foreign Exchange Service (FX)

3.06 A Foreign Exchange (FX) Line can be thought of as a tie line between a PABX and a CO which is located in a telephone area other than that designated for the PABX. Via an FX Line, the PABX appears to the distant CO as a local subscriber and is billed accordingly for calls which are placed through that CO. FX lines have two applications. The first offers a method of reducing telephone cost in business situations where many toll calls are made to destinations which are within close proximity to one another. For example, a COM-

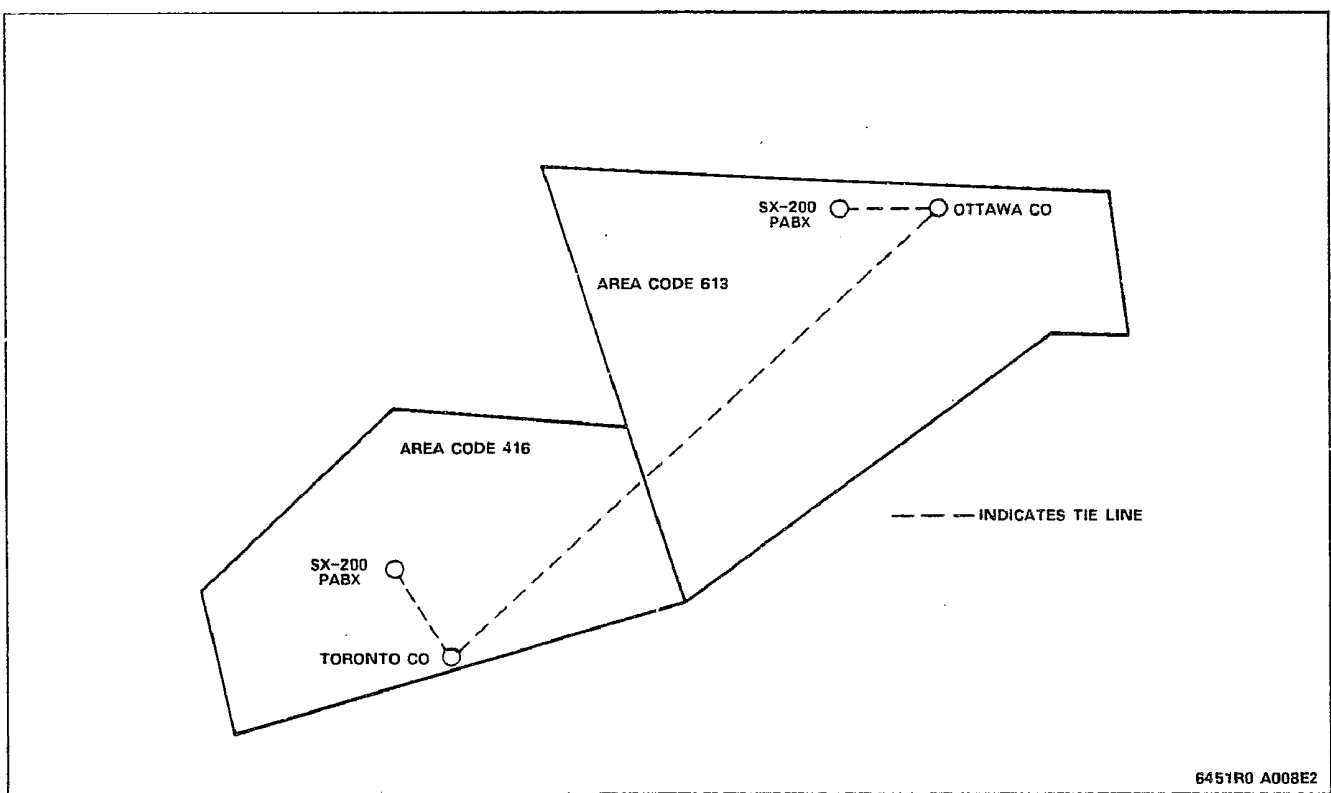


Figure 3-1 Typical Tie Line

pany located in Ottawa which does much of its business with companies located in and around Toronto could benefit from an FX line, as shown in Figure 3-2. The second application allows a company to offer the use of the FX to its customers so as to permit them to call the company office (the PABX) without incurring toll charges.

### Wide Area Telephone Service (WATS)

3.07 The Wide Area Telephone Service is designed to meet the needs of customers who make or receive a large number of long distance calls to or from the same geographical region(s) within the home country. Calls are originated via Outward WATS lines and received over Inward WATS lines (600 Service). Generally, each such line is arranged to provide either inward or outward service, but not both.

3.08 WATS divides the country into geographical regions known as zones. Zones are incremental, numbering 1 through n, from the home zone. For example, zone 4 provides a WATS subscriber in the home zone (zone 1) with access to all telephone subscribers in zones 1, 2, 3 and 4. Likewise, zone n provides a WATS subscriber in the home zone with access to all telephone subscribers in all zones. Figure 3-3 shows Canadian WATS zones, 1-6, and the zone numbering which is unique to WATS subscribers with Area Code 613, where MITEL Corporation headquarters is located.

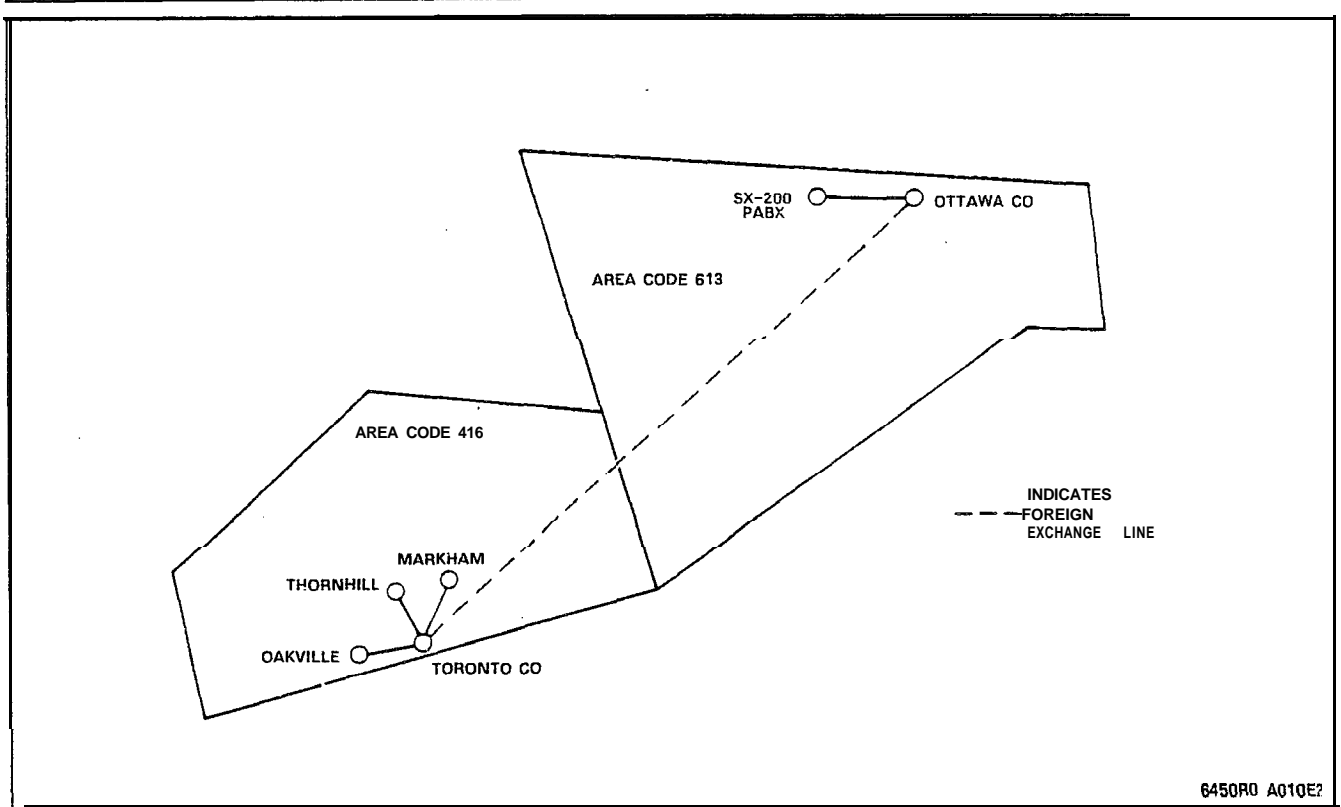


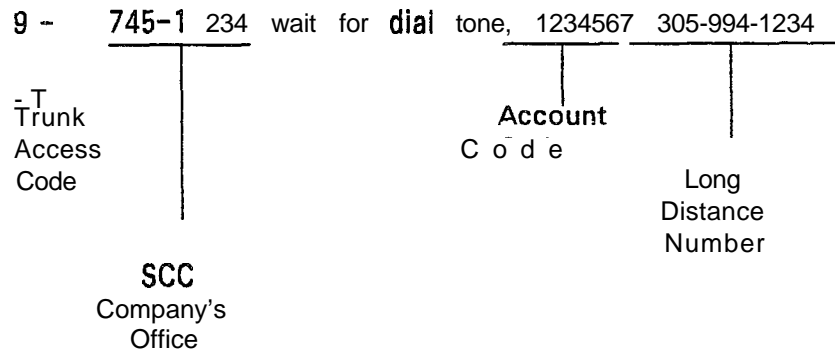
Figure 3-2 Typical Foreign Exchange Line

3.09 The rates for both Outward and Inward WATS are based on the zone and the hours of service subscribed to by the customer.

**Specialized Common Carrier Service (SCC)**

3.10 Specialized Common Carrier Service, offered by private companies, provides telephone service between major locations at a rate which may be less than that charged by the telephone companies. The rate is based on monthly subscription plus a usage charge.

3.11 When a business subscribes to an SCC it is issued with an account code (normally seven digits). Calls can then be routed via the company's office by dialing a digit string similar to that shown in the following example:





3.12 The restriction of this service is that some **SCC** directories are limited to major locations. Therefore, to avoid additional toll charges, the SCC company office must be within a local dialing distance. A typical SCC arrangement is shown in Figure 3-4.

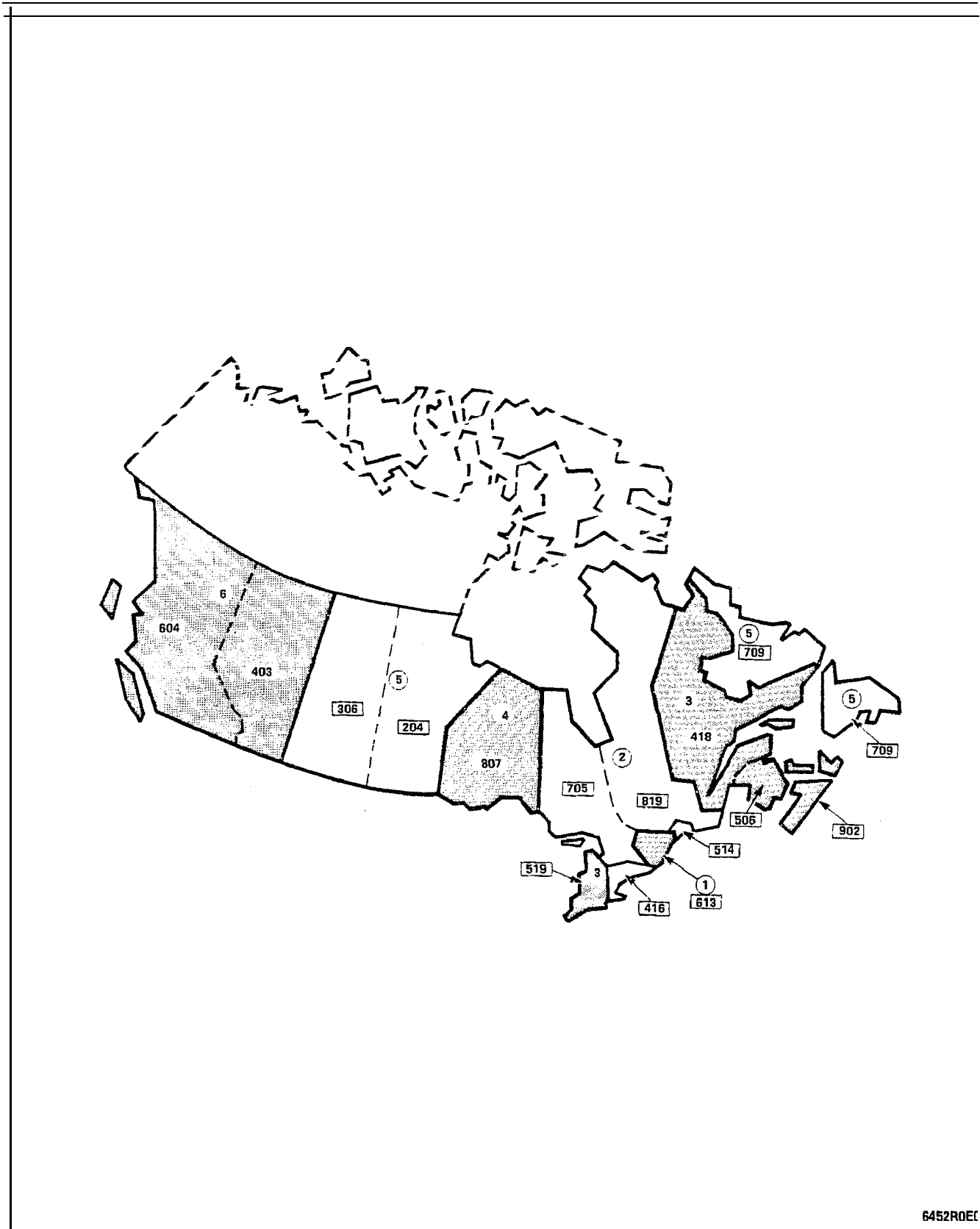


Figure 3-3 Canadian WATS Zoning (Zone 1 Being Area Code 613)

# Automatic Route Selection and Toll Control

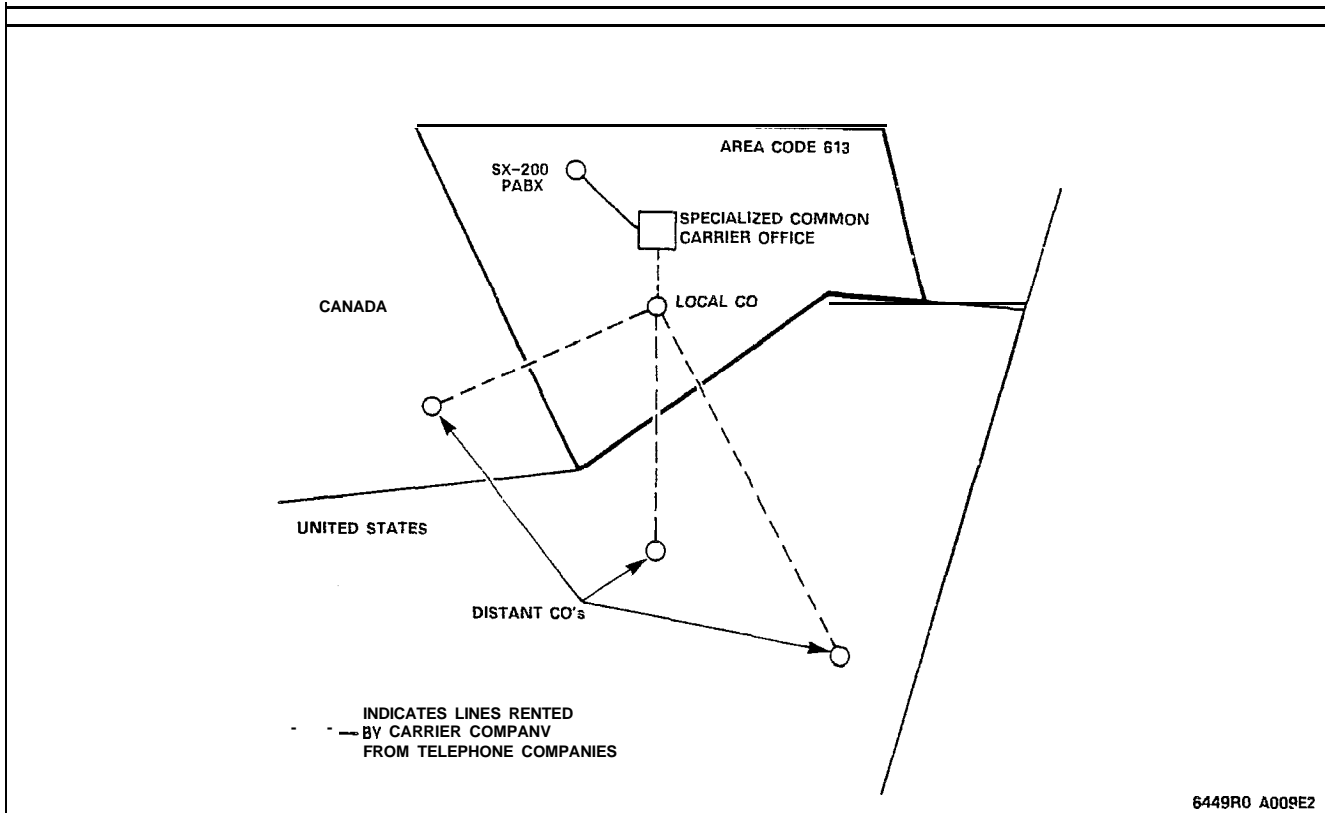


Figure 3-4 Typical SCC Arrangement

## 4. DETAILED DESCRIPTION

### introduction

4.01 The ARS feature is part of the Generic 1000 and Generic 1001 software packages of the SX-200<sup>®</sup> DIGITAL PABX, which automatically selects one of a preprogrammed list of Trunk Routes every time an outgoing call is made. The routes are selected via the digits dialed, in order of cost (i.e., least expensive route first), and in accordance with the caller's toll restriction. The use of digit analysis and digit modification within the ARS package allows the system to recognize and modify any digit string which is dialed by the user, thus alleviating the need for the user to dial special trunk access codes, or to dial a different digit string for each of the various routes to the same destination.

4.02 The complete ARS package provides the following:

- Alternative Routing
- Least Cost Routing
- Toll Control
- Overlap Outpulsing
- Expensive Route Warning
- Callback Queueing
- Camp-on Queueing
- Return Dial Tone.

### Alternative Routing

4.03 Alternative Routing is the automatic selection of an alternate Trunk Route when the first choice is busy. Routes (e.g., tie trunks or WATS lines), are preprogrammed in an implied order within the Route List Definition Table as described in paragraph 5.13.

### Least Cost Routing

4.04 Least Cost Routing enables the customer to capitalize on the cost benefits offered by each type of trunk by allowing the installation company to define, via the Route Plans and Route Lists Tables, the order in which the Trunk Groups are to be selected. A number of different Route Lists can be defined to account for the fluctuation in rates with respect to the day and time of the week. Route lists are associated with day and time zones through the programming of the Day Zones and Route Plans Tables, described in paragraphs 5.05 and 5.16.

### Toll Control

4.05 Toll Control is an integral part of the ARS feature package. It allows the customer to restrict user access to specific Trunk Routes and/or specific directory numbers.

4.06 Every peripheral device which is capable of accessing a trunk is assigned a class of restriction (COR). These CORs are arranged within COR Groups, which are associated with Trunk Groups through the programming of the Route Definition table. The Route Definition table defines: (1) a trunk group, (2) how the digits dialed are to be modified, and (3) which classes of restriction CANNOT access the route. A maximum of 50 COR Groups, each containing a maximum of 25 COR members, can be programmed. A COR Group is simply a list comprised of several COR members. Once constructed, the group is assigned a number (1 to 50). This is the number used in route definition.

4.07 Toll control takes place in the following way. Each time a trunk call is initiated, the system checks that the COR of the originating device is NOT included in the COR Group assigned to the selected trunk route, thus verifying that the call is toll allowed (that is, the user is authorized to make the call).

4.08 CORs are assigned to peripheral devices during the initial system programming, in accordance with the customer's requirements, and can be modified at any time from an attendant workstation or CDE terminal by the proper authority (e.g., the telephone manager).

#### Overlap Outpulsing

**4.09** The basic principle of overlap outpulsing is to seize a trunk and commence outpulsing as soon as sufficient digits have been received to identify the route. This is necessary in order to minimize the post-dialing delay which would otherwise be experienced due to the serialization of digit collection, trunk seizure, and digit outpulsing. The number of digits collected prior to outpulsing can be programmed by the customer during Customer Data Entry (CDE). These digits may be subject to digit modification prior to being passed to the appropriate sender (dial pulse or DTMF) for outpulsing. Subsequent digits are collected by the system and are out-pulsed. At the end of dialing, indicated by an interdigit time-out, or the dialing of a complete digit string of known length, the dialing sender is disconnected. System Option 26 (No Overlap Outpulsing) inhibits overlap outpulsing for all calls.

4.10 The post-dialing delay (i.e., the time lapse between the completion of station dialing and the receipt of ringback) which would be experienced when using a DTMF trunk, is minimum (slightly more than 1 second for a 10-digit number). If no overlap outpulsing is enabled, the delay for a 10-digit number outpulsed over a dial pulse trunk would be approximately 16 seconds at 10 PPS.

4.4 1 Trunk Routes are seized only after the ARS process has determined the validity of the call with respect to the caller's class of restriction. In this way, false traffic will not be generated at the CO (or distant PABX) by aborted seizures.

### Expensive Route Warning Tone

4.12 The Expensive Route Warning Tone is a programmable option which presents a tone to the user during call setup, and, if a SUPERSET 4™ set is used, the message “EXPENSIVE ROUTE” appears on the LCD, when the Route selected by ARS is programmed as an expensive route. Any Route but the first may be programmed to deliver an Expensive Route Warning Tone. When alerted by the warning, the user then has the option of whether or not to continue the call.

### Callback Queueing

4.13 Callback Queueing (Automatic Callback) allows a user who encounters busy tone after dialing an ARS digit string (i.e., all trunks busy) to dial a callback access code, or, if a SUPERSET 4 set is used, to select CALLBACK, and be placed in a queue for the first available trunk. When a trunk becomes free, it will be seized, the originating device will be rung back, and, when answered, the previously entered digits will be automatically outpulsed. Expensive Route choices are skipped when ARS scans for an available trunk, when honouring a callback.

### Camp-on Queueing

4.14 Camp-on Queueing allows the user who encounters busy tone after dialing an ARS digit string (Le., all trunks busy) to wait off-hook, or, if a SUPERSET 4™ set is used, to select CAMP ON, and remain off-hook until a trunk becomes free. (When a set other than a SUPERSET 4™ set is used, the user remains off-hook for 10 seconds and is automatically camped on to the busy trunk group.) When a trunk becomes free, the system seizes it automatically, and the previously entered digits are automatically outpulsed. Expensive Route choices are skipped when ARS scans for an available trunk, when honouring a camp-on.

### Return Dial Tone

4.15 Return Dial Tone is a programmable option which allows the system to simulate CO dial tone for customers who consider that its absence would confuse the users of their system. For further information, refer to Part 5, ARS Tables, paragraph 5.21.

## 5. ARS TABLES

### General

5.01 The ARS package is a network of tables, each of which contains data relevant to the setting up of a trunk call, such as routing options and **CORs**. The tables are interconnected through a series of indices and pointers. A total of eight tables make up the ARS network. They are, in order of programming:

- COR Group Definition Table
- Day Zone Definition Table
- Modified Digit Table
- Route Definition Table
- Route Lists Table
- Route **Plans** Table
- ARS Digit Strings Table
- ARS Nested Digit Strings Table.

5.02 The hierarchy for the tables is shown in Figure 5-1. This hierarchy is followed by the system in deciding which routes to select, and which users are toll-restricted on the selected routes. The following paragraphs describe the layout and fields of each table. Refer also to Section MITL9108-093-206-NA, Installation Forms and Section MITL9108-093-210-NA, Customer Data Entry, for further information. The way in which the tables combine to form the ARS network is described in general in Part 6, and in the scenario given in Part 7.

### ARS **COR** Group Definition Table (CDE Form 20)

5.03 The **CORs** of the peripheral devices are grouped within the Class of Restriction Group Definition Table. These **COR** Groups are referenced from the Route Assignment table and their contents are interrogated to determine whether or not the calling device has insufficient privilege to complete the call. Absence of the calling device's **COR** from a **COR** Group indicates to the system that the call **CAN** be completed. A maximum of 50 **COR** Groups, each containing a maximum of 25 members, can be programmed. **COR** members are numbered in the range 1 through 25; **COR** Groups are numbered in the range 1 through 50.

5.04 The **COR** Group Definition Table has three fields:

**COR Group:** This is a nonprogrammable field which lists the **COR** Group numbers 1 through 50.

**COR Group Members:** This programmable field is used to specify which **COR** Group members **are** to be associated with the specified Group Number. **COR** member numbers range from 1 to 25 and may be entered in **any** order (member numbers must, however, be separated with spaces) or, where entries are consecutive, in the format, for example: 1-13.

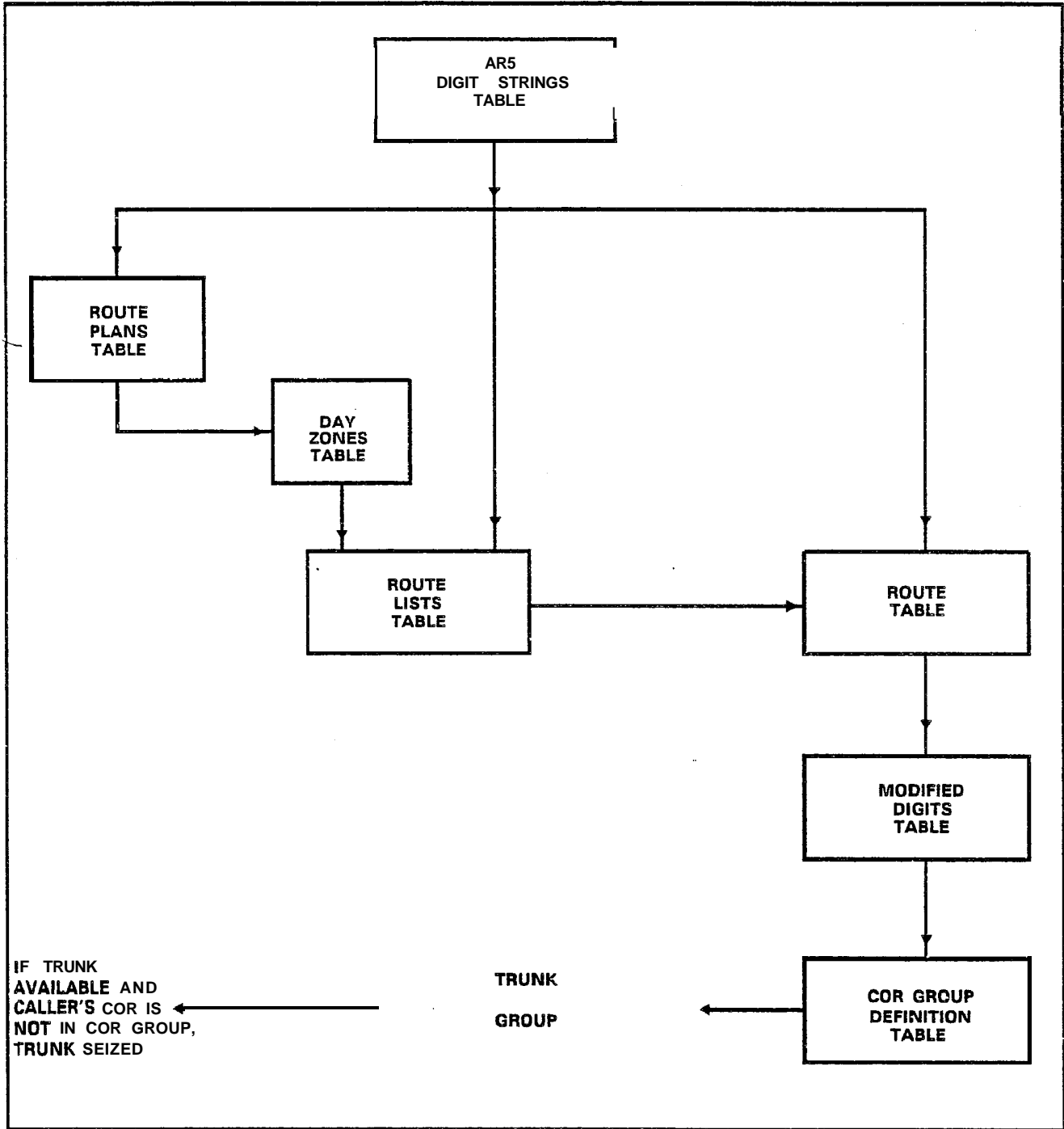


Figure 5-1 ARS Table Hierarchy

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TABLE 5-1  
COR GROUP DEFINITION TABLE

CDE TERMINAL DISPLAY

COR GROUP	COR GROUP MEMBERS (SEPARATE WITH SPACES)				COMMENTS
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
01					
1-	2-	3-	4-TOP	5-BOTTOM	
6-QUIT	7-COR GROUP	8-DELETE	9-	0-ENTER	

ATTENDANT CONSOLE DISPLAY

COR GROUP	COR GROUP MEMBERS (SEPARATE WITH SPACES)				COMMENTS
01					
<input type="checkbox"/> F6>QUIT	<input type="checkbox"/> F7>COR GROUP	<input type="checkbox"/> F8>DELETE	<input type="checkbox"/> F9>	<input type="checkbox"/> F4>TOP	<input type="checkbox"/> F5>BOTTOM

Comments: This programmable field is used by the programmer to enter any 20-character-long reminder against each Group Number.

ARS Day Zone Definition Table (CDE Form 21)

5.05 Since telephone call rates vary during the day, and with the days of the week, the system must be able to select the least expensive route based on this schedule. The Day Zone Definition table does this. The week may be broken into a maximum of three zones. Typically, these are (1) Monday through Friday, (2) Saturday, and (3)

**Sunday.** The information from this table is used in Route Plan definition.

**5.06** The system allows for one definition of three Day Zones. The Day Zone Definition table accommodates this feature. The table has eight fields:

**Day Zone:** This is a nonprogrammable field which lists the zone numbers 1 through 3.

**Mon-Sun:** These seven programmable fields either ENABLE (shown by "\*") or DISABLE (shown by a blank) a given Day Zone on a given day of the week. Positioning the cursor on the desired day of the week results in softkey 1 showing the opposite function to what is entered in that field. For example, if Day Zone 1, MON, is ENABLED (an asterisk is displayed), the softkey will show DISABLE. Pressing the softkey will disable that day zone for that day. The MON field will then be blank for Day Zone 1, and the softkey will now show ENABLE.

TABLE 5-2  
ARS DAY ZONE DEFINITION

CDE TERMINAL DISPLAY

DAY ZONE	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.
01 02 03							
01							
1-DISABLE	2-		3-		4-		5-
6-QUIT	7-		8-DELETE		9-		0-ENTER

ATTENDANT CONSOLE DISPLAY

DAY ZONE	MON.	TUE.	WED.	THU.	FRI.	SAT.	SUN.
01							
•1 F1>DISABLE □ F6>QUIT	□ F2> □		■ F3> ■ F8>DELETE	□ F4> □ F9>		□ F5> □ F0>ENTER	

ARS Modified Digit Table (CDE Form 22)

5.07 The Modified Digit Table contains a maximum of fifty I-line entries. These are sequences indexed through a numerical index, 1 through 50, and are associated with routes through the Route Definition table.

5.08 The purpose of Digit Modification is to allow the station user to dial **calls** in a consistent pattern, regardless of the destination of the call, or how it is routed. This table, then, directs the system as

to how digits are to be inserted into or deleted from the dialing sequence. For example: An FX trunk is installed between two cities, permitting calls to be placed between the two as if they were local calls. A caller in one of the cities placing a call to the other city would dial the distant area code, unaware that the system will automatically select the FX routing for the call. The Modified Digits Table would therefore instruct the system to delete the dialed area code from the dialing sequence when the FX route was chosen by the ARS package. Note: The system will not **automatically** delete or insert any digits. The digits to be inserted or deleted must be specified by the CDE programmer.

5.09 The Modified Digit table contains four fields:

**Entry Number:** This nonprogrammable field **lists** the entry numbers 1 through 50. The entry number is used in route definition.

**Quantity to Delete:** This **programmable** field defines the number of leading digits that the system must delete from a valid digit string prior to outpulsing. A maximum of 25 digits may be specified.

**Digits to be Inserted:** This programmable field defines the digits and dial tone markers which are to be inserted in place of the digits deleted by the previous field. These digits are therefore prefixed to the modified valid digit string, and outpulsed over the trunk. The digits **may** be telephony digits 0 through 9, and for DTMF trunks 0 through 9, \*, and #. The field can be programmed with up to 20 characters in Generic 1000, or 27 characters in Generic 1001 (i.e., combinations of digits and special markers, where a special marker represents one character, such as \*1). The following dial tone markers may be inserted:

- x1 = Pause for five seconds
- \*2 = Wait for dial tone
- \*3 = Switch to **DTMF** for all further dialing on this call
- \*4 = Do **not** display further modified digits on sets or SMDR
- \*5 = Pause 10 seconds

To generate \* on a trunk, \*\* must be inserted.

**Comments:** This programmable field permits the CDE programmer **to** enter any comment desired against each **entry** number. The maximum length of **the** comment is 20 characters.

TABLE 5-3  
ARS MODIFIED DIGIT TABLE

CDE TERMINAL DISPLAY

ENTRY NUM	QTY TO DELETE	DIGITS TO BE INSERTED		COMMENTS
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
01				
1-	2-	3-	4-TOP	5-BOTTOM
6-QUIT	7-ENTRY NUM	8-DELETE	9-	0-ENTER

ATTENDANT CONSOLE DISPLAY

ENTRY NUM	QTY TO DELETE	DIGITS TO BE INSERTED		COMMENTS
01				
<input checked="" type="checkbox"/> F1>	<input type="checkbox"/> F2>	<input type="checkbox"/> P3>	<input type="checkbox"/> F4>TOP	<input type="checkbox"/> F5>BOTTOM
<input type="checkbox"/> F6>QUIT	<input type="checkbox"/> F7>ENTRYNUM	<input type="checkbox"/> F8>DELETE	<input type="checkbox"/>	<input checked="" type="checkbox"/> F0>ENTER

ARS Route Definition Table (CDE Form 23)

5.10 The Route Definition table contains a maximum of 200 one-line entries. Each entry identifies a route. A Route comprises a Trunk Group, the COR Group associated with the Trunk Group, and an index to the Digit Modification Table. The layout of the Route Definition table is shown in Table 5-4.

**5.11** The same Trunk Group may be used to create several routes; for example, a call in the U.S.A. may be routed via either the primary or secondary Specialized Common Carrier service (SCC). Also, COR Groups may be varied, so that different COR Groups are assigned to the same Trunk Group. Because of these variations, more Routes are required than Trunk Groups. The SX-200<sup>®</sup> DIGITAL PABX therefore allows for programming of up to 200 Routes, thus allowing for a worst-case situation of the assignment of four Routes to each of the 50 Trunk Groups.

**5.12** The Route Definition table contains five fields, as described below:

**Route Number:** This nonprogrammable field lists the 200 route numbers

**Trunk Group Number:** This programmable field identifies the Trunk Group associated with each Route. Entries are made in the form of 1- or 2-digit numbers in the range of 4 through 50. A maximum of 50 Trunk Groups may be programmed.

**CQR Group:** This programmable field identifies the COR Group associated with each Trunk Group. Entries are made in the form of 1- or 2-digit numbers in the range of 1 through 25. A maximum of 25 COR groups may be programmed.

**Modified Digit Entry:** This programmable field is the Entry Number on the Modified Digit table. Entries are made in the form of 1- or 2-digit numbers in the range of 1 through 50. This entry is used by the system as an index to the Modified Digit table.

**Comments:** This programmable field permits the CDE programmer to enter any comment desired against each entry number. The maximum length of the comment is 20 characters.

**TABLE 5-4  
ARS ROUTE DEFINITION TABLE**

**CDE TERMINAL DISPLAY**

ROUTE NUM	TRUNK GROUP	COR GROUP	MOD DIGIT ENTRY	COMMENTS
01 02 03 04 05 08 07 08 09 10 11 12				
01				
1-	2-	3-	4-TOP	5-BOTTOM
6-QUIT	T-ROUTE NUM	8-DELETE	9-	0-ENTER

**ATTENDANT CONSOLE DISPLAY**

ROUTE NUM	TRUNKGROUP	COR GROUP	MOD DIGIT ENTRY	COMMENTS
01				
<input type="checkbox"/> X#00	<input type="checkbox"/> F2>	<input checked="" type="checkbox"/> F3>	<input type="checkbox"/> F4>TOP	<input checked="" type="checkbox"/> F5>BOTTOM
<input type="checkbox"/> F6>QUIT	<input checked="" type="checkbox"/> F7>ROUTE NUM	<input checked="" type="checkbox"/> F8>DELETE	<input checked="" type="checkbox"/> F9>	<input type="checkbox"/> F0>ENTER

**ARS Route Lists Table (CDE Form 24)**

5.13 The Route Lists table contains a maximum of 100 one-line entries, each of which defines up to six Routes. The Routes within each entry are listed in the order in which they are to be tried: i.e., least expensive (Route 1) to most expensive (Route 6). If there are two or more Routes to a given set of locations, and the order in which they are to be tried changes with the time of day, because of rate changes, then two Lists must be programmed to reflect this.

5.14 The table makes provision for the assignment of an Expensive Route Warning to each of the second through sixth Routes, as required by the customer.

5.15 Layout of the table is shown in Table 5-5. The seven fields which comprise the table are described below:

**List Number:** This nonprogrammable field lists the Route List entries. Up to 100 Route Lists, each having up to six Route choices, may be programmed.

**First:** This programmable field defines the first choice (least expensive) Route. This Route is identified by a 1-, 2-, or 3-digit number in the range of 1 through 200. The number in this field is the Route Number from the Route Definition table.

**Second:** This programmable field contains one subfield. This field defines the second choice route. This route is identified by a 1-, 2-, or 3-digit number in the range of 4 through 200. The number in this field is the Route Number from the Route Definition table. The subfield enables the Expensive Route Warning (WT), associating the warning with this Route. When the warning is required, ON is entered; when the tone is not required, the WT subfield is left blank. The default value is no expensive route warning (blank subfield).

**Third through Sixth:** These programmable fields are identical to the "Second" field, defining the third, fourth, fifth and sixth route choices.



TABLE 5-5  
ARS ROUTE LISTS TABLE

CDE TERMINAL DISPLAY

LIST NUM	FIRST	SECOND	WT	THIRD	WT	FOURTH	WT	FIFTH	WT	SIXTH	WT
01											
02											
03											
04											
05											
06											
07											
08											
09											
10											
11											
12											
01											
1-		2-		3-		4-TOP		5-BOTTOM			
6-QUIT		7-ROUTE NUM		8-DELETE		9-		O-ENTER			

ATTENDANT CONSOLE DISPLAY

LIST NUM	FIRST	SECOND	WT	THIRD	WT	FOURTH	WT	FIFTH	WT	SIXTH	WT
01											
<input checked="" type="checkbox"/> F1>	<input checked="" type="checkbox"/> F2>	<input type="checkbox"/> F3>		<input type="checkbox"/> F4>TOP		<input type="checkbox"/> F5>BOTTOM		<input type="checkbox"/> F6>QUIT	<input checked="" type="checkbox"/> F7>ROUTE NUM	<input type="checkbox"/> F8>DELETE	<input type="checkbox"/> F9>
											<input type="checkbox"/> F0>ENTER

ARS Route Plans Table (CDE Form 25)

5.16 The SX-200<sup>®</sup> ARS package accommodates a maximum of 50 Route Plans, each of which is contained within a dedicated Route Plans table. The header of each table contains the Time Zone and the number of the Day Zone which is to be associated with the Route Plan. When first accessed, Route Plan 1 is displayed. By selecting the "ROUTE PLAN" softkey, the current route plan is identified, and the display prompts for the route plan desired: "ROUTE PLAN = ". Entering a number (1 through 50) results in the associated plan being displayed.

5.17 This table defines which list of Routes (see Route Lists Table) is to be used in any given Time Zone (1 through 6), in any given Day Zone (1 through 3). Up to six Time Zones may be defined for each Day Zone, creating a total of 18 possible Time Zones per week. A different Route List may be specified for each of these. When Time Zone 1 is in effect, the Route List used at a given time is determined by specifying a START HOUR. The hour is specified as a 2-digit number (00 through 23). The last START HOUR will create a time period which extends from that time up to the first START HOUR listed, thus creating a Time Zone loop for each Day Zone. If no Route List is specified for a given START HOUR entry, then all calls accessing the Route Plan containing this omission WILL BE DENIED.

5.18 The Route Plans table is referenced from the ARS Digit String table. The layout of the table is shown in Table 5-6.

5.19 The Route Plans table contains four fields:

**Time Zone:** This nonprogrammable field lists the six Time Zone numbers associated with the currently accessed Route Plan.

**Day Zone 1:** This programmable field consists of two subfields, used to assign the Start Hour and Route List number. The Start Hour subfield indicates the time (in 24-hour format, 00 to 23) from which the Route List is available. The Route List is available until the start hour of the next Time Zone. (Note: Day Zones are planned on the Day Zone Definition table. Day Zone 1 is typically Monday through Friday; Day Zone 2 is typically Saturday; and Day Zone 3 is typically Sunday.) Thus, this field on the Route Plans table informs the system as to what times each Day Zone is to be in effect. The Route List subfield informs the system as to what Route List is to be used during these times in these Day Zones.

**Day Zone 2, and Day Zone 3:** These programmable fields are identical to Day Zone 1.

**TABLE 5-6  
ARS ROUTE PLANS TABLE**

**CDE TERMINAL DISPLAY**

TIME ZONE	DAY ZONE 1		DAY ZONE 2		DAY ZONE 3	
	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST
01						
02						
03						
04						
05						
06						
01						
6-QUIT		Z-ROUTE NUM	8-DELETE		9-	O-ENTER

**ATTENDANT CONSOLE DISPLAY**

TIME ZONE	DAY ZONE 1		DAY ZONE 2		DAY ZONE 3	
	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST
01						
<input checked="" type="checkbox"/> F6>QUIT	<input checked="" type="checkbox"/> F7>COR GROUP	<input type="checkbox"/> F8>DELETE	<input type="checkbox"/> X*000	<input type="checkbox"/> F0>ENTER		

**ARS Digit Strings Tables (CDE Form 26)**

5.20 The ARS Digit Strings tables consist of one primary and one nested table. The nested table is accessed from the primary table by pressing the "SHOW STRINGS" **softkey** on the Attendant Console or CDE terminal. (Note: If no leading digits are entered on the primary table, the nested table cannot be accessed.) The primary table permits the programming of leading digit information. Actual digit strings and routing information for each of the leading digit entries is programmed on the nested table.

5.21 The primary table is shown in Table 5-7, and the nested table in Table 5-8. The primary (leading digits) table is comprised of three fields, as follows:

**Leading Digits:** This is essentially the same as a Trunk Group access code, such as the number "9", but may be any digit combination the customer desires to be analyzed. A maximum of 100 leading digit combinations may be specified.

**Return Dial Tone:** This field allows a simulated dial tone to be returned to the call originator, after the "dial 9" access code for trunks has been received by the system, since the Central Office dial tone is not returned until digit analysis has been completed and a trunk seized. A YES or NO value is entered via the appropriate **softkey** on the Attendant Console or CDE terminal. The default value is NO.

**Restricted COR Group:** This field is optional, and may be programmed with a COR Group number between 1 and 50. Programming a COR Group number in this field will define which group members will NOT be permitted to dial the specified leading digits. If access to specified leading digits is unrestricted, the field is left blank. For example, if all users are permitted to dial the leading digit "9", the field would be left blank. If only those peripheral devices tagged as COR 1 are permitted to dial a given leading digit combination, the **COR** Group must list ALL **CORs** EXCEPT COR 1.

5.22 The nested form specifies the actual digit strings which are to be analyzed. The form is comprised of four fields; the fourth field being subdivided into two. The fields are:

**Digits to be Analyzed:** Each line in this programmable field constitutes one entry. Digits programmed in this field are used by the system **in** conjunction with the leading digits to select the appropriate Route. The following wildcard digits may be specified to simplify entering the digit strings:

- NOX
- N1X
- X,

where N is any digit from 2 through 9 and X is any digit from 0 through 9.

NOX and N1X may ONLY be used at the BEGINNING of the digit string; X may ONLY be used at the END of the digit string. The **wildcard** digits allow for the following cases: (1) To cover routing for any area code NOT SPECIFICALLY ROUTED, NOX and N1X followed by seven digits would cover all unspecified area codes. (2) NOX-555-1212 and N1X-555-1212 covers routing for all free directory assistance calls. (3) If routes are to be selected based on office codes, blocks of office codes can be specified, as, for example, 82X, 83X, etc. The system sorts digit

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strings in such a way that explicitly stated digit strings will be routed to their routes, while all others will be covered by wild-cards. The ordering of digit strings is performed automatically by CDE after each string is entered. If two routes are defined for 416 and 416-555-1212, CDE will ensure that the specific string will occur first in the digits to be analyzed field. The number of entries which can be made in this field is limited only by the amount of available system memory.

**Quantity to Follow:** This programmable field specifies the number of digits to be dialed AFTER the digits to be analyzed, and may be specified as "UNKNOWN". The advantage of specifying the quantity to follow; i.e., 9-592 + 4 digits, is that when the final digit is received, outpulsing can begin, and the DTMF receiver can be dropped; if UNKNOWN is specified, the interdigit time-out must occur before these happen, thus tying up PABX resources for a longer time each call. The total number of digits in this field, and the digits to be analyzed field, plus the leading digits (from the primary table), must be no greater than 26 digits in length.

**Account Code Required:** This programmable field is used to specify digit strings which are to be treated as "long distance" in order to enforce the COS option "FORCED ACCOUNT CODE ON LONG DISTANCE CALLS". In Generic 1001, this field is also for Room Status Restriction in Hotel/Motel applications, to restrict long distance calls. A caller with this COS option must have entered an account code prior to dialing one of the designated digit strings. A YES or NO value must be specified.

**Termination Type and Number:** Digits dialed may terminate on a Route, a Route List, or a Route Plan. These two subfields combine to index where each valid digit string is to be found. The first subfield is programmed with one of ROUTE, LIST, or PLAN, depending on whether a Route, Route List, or Route Plan is indexed. The second subfield contains the number of the entry within the table referenced in the first subfield. For example: Many destinations can be accessed only by direct distance dialing (DDD). For such a destination, ROUTE is specified as the Termination Type. Free calls such as the 555-1212 directory assistance case (in North America) always terminate directly on a Route for DDD. If several Route choices are available, a LIST is specified as the Termination Type, if the choices do not vary with time of day. A Route Plan, with Day and Time Zone variations, is not required. This situation arises where an FX route is always preferred over DDD. In a situation where multiple Route choices are offered, with preferences depending on time of day and day of the week, a termination type of PLAN -is specified.

TABLE 5-7  
ARS DIGIT STRINGS TABLE - LEADING DIGITS

CDE TERMINAL DISPLAY

LEADING DIGITS		RETURN DIAL TONE		RESTRICTED COR GROUP	
		NO			
		NO			
1-	2-	3-INSERT	4-	5-	
6-QUIT	7-LEADING DIG	8-DELETE	9-SHOW STRINGS	0-ENTER	

ATTENDANT CONSOLE DISPLAY


LEADING DIGITS		RETURN DIAL TONE		RESTRICTED COR GROUP	
		NO			
<input type="checkbox"/> F0>	<input type="checkbox"/> F2>	<input type="checkbox"/> F3>INSERT	<input type="checkbox"/> j4>	<input checked="" type="checkbox"/> F5>	
<input type="checkbox"/> F6>QUIT	<input type="checkbox"/> F7>LEADING DIG	<input checked="" type="checkbox"/> F8>DELETE	<input checked="" type="checkbox"/> F9>SHOW STRINGS	<input type="checkbox"/> F0>ENTER	

**TABLE 5-8  
ARS DIGIT STRINGS - NESTED TABLE**

**CDE TERMINAL DISPLAY**

DIGITS TO BE ANALYZED		QTY TO FOLLOW		ACC CODE REQD	TERM TYPE AND NUM
1-	2-	3-INSERT	4-NOX	5-x	
6-QUIT	7-FIND STRING	8-DELETE	9-N1X	O-ENTER	

**ATTENDANT CONSOLE DISPLAY**

DIGITS TO BE ANALYZED		QTY TO FOLLOW		ACC CODE REQD	TERM TYPE AND NUM
<input checked="" type="checkbox"/> F1>	<input type="checkbox"/> 	<input checked="" type="checkbox"/> F3>INSERT	<input type="checkbox"/> F4>NOX	<input type="checkbox"/> F5>x	<input type="checkbox"/> F0>ENTER
<input type="checkbox"/> F6>QUIT	<input type="checkbox"/> F7>FINDSTRING	<input type="checkbox"/> F8>DELETE	<input type="checkbox"/> F9>N1X		

## 6. ARS OPERATION: GENERAL APPROACH

### General

6.01 The object of ARS is to choose one route a call may take from one location to another, when several routes are available. The ARS package, then, is the software program which instructs the system on how to make the choice. The choice the system eventually does make depends upon the parameters defined within it by the CDE programmer. These are not arbitrary. The parameters are determined by the needs of the SX-200<sup>®</sup> DIGITAL PABX.

6.02 Programming the ARS features properly therefore requires (1) an understanding of what the customer needs, and (2) what the system must know to reflect those needs. It is important for the ARS programmer to have a good understanding of the cost structure of the different routes leading from the PABX to any called destination, since it is largely on the basis of cost that the route selection takes place.

### Programming Process ■ General

6.03 In general, the ARS programming process follows this plan:

1. Determine the customer's needs. The needs of the customer will determine what types of calls will be permitted by which peripheral devices. Knowing this, the ARS programmer can assign classes of restriction to the peripheral devices (CDE Form 9).
2. Determine the customer's facilities. The ARS programmer must know with what types of trunks the customer is equipped (CDE Forms 14 and 15) and the relative cost of each to the customer.
3. Define CORs and COR Groups (CDE Form 20) and apply these to Trunk Groups. The COR Group tables specify which classes of restriction will be toll-denied on a given route.
4. Define Day Zones (that is, when rates will vary), Modified Digits, Routes, Lists, and Plans.
5. Define Digit Strings. The Leading Digits and Digit Strings data are most important, since these form the link between what the set user dials, and what plan, list, or route is used.

6.04 Note that the ARS decision hierarchy, as shown in Figure 5-1, is essentially the inverse of the programming procedure. The first data programmed (COR members) are the last used in the ARS decision. The last data programmed (Digit Strings and Leading Digits) are the first used in the ARS decision, and point towards, the required route, route list, or route plan. The rationale for this dual approach to the ARS structure is this: From the system's viewpoint, COR groups and members define the "rank" of each user in importance to the system. When ARS is given a digit string, it will ultimately accept or reject the call on the basis of the rank of the peripheral device at-



tempting to make the call, but in order to do this, it must first determine how the desired call is to be routed. From a programming viewpoint, it is necessary to identify who possesses what rank before access to the various routes can be allowed or denied. In this way, digit analysis programming must take place with the COR of the peripheral devices always in mind.

## 7. APPLICATION

### General

7.01 The implementation of ARS on the SX-200<sup>®</sup> DIGITAL PABX is a 2-stage process. First, data must be collected concerning the customer's needs and the facilities he possesses, such as trunk groups. From this data, the ARS plan can be formulated on paper (refer to Section MITL9108-093-206-NA, Installation Forms). Second, the plan must be transferred from paper to the system memory, through the Attendant Console or CDE terminal (refer to Section MITL9108-093-210-NA).

### Scenario

7.02 This scenario begins with the first stage of ARS implementation, namely, the data collection and ARS plan formulation stage. For the purposes of this scenario, a fictitious company is established.

7.03 The company has two Canadian locations: its headquarters in Ottawa, and a service office in Winnipeg. The company also has (1) a plant in Boca Raton, Florida, (2) major accounts and suppliers in the Toronto area, and (3) must be able to make international telephone calls. The SX-200<sup>®</sup> DIGITAL PABX located in Ottawa is to be programmed.

### Trunk Groups

7.04 In consulting the traffic studies performed by the SX-200<sup>®</sup> DIGITAL PABX installation company, it was decided, in conjunction with the customer, that the PABX in Ottawa would be most cost-effective when connected to the public network via four trunk groups, and an SCC (specialized common carrier) link. The trunk groups were defined as follows:

- **Trunk Group 1:** Local Trunks, and Specialized Common Carrier account, for calls to the Boca Raton plant.
- **Trunk Group 2:** Zone 2 WATS Trunks (covering area codes 613, 416, 705, 819, and 514)
- **Trunk Group 3:** Ottawa-to-Toronto FX Line
- **Trunk Group 4:** Two-way Tie Line to the Winnipeg office

7.05 The cost guidelines which apply to these groups are:

1. Tie Lines and **FX Lines** are always less expensive than any other trunk group.
2. WATS is less expensive than Direct Distance Dialing during the hours of **08:00** through 18:00 Monday through Friday, and **08:00** through 12:00 hours Saturday.

3. SCC is less expensive than Direct Distance Dialing during the hours of 8:00 through 18:00 Monday through Friday, and 08:00 through 12:00 hours Saturday.

7.06 The following office codes are to be allowed:

**Toronto: 47 1, 825, 678**  
**Winnipeg: 786**  
**Ottawa: All office codes**  
**Boca Raton: 994.**

Trunking network for this scenario is shown in Figure 7-1.

### **COR Assignments**

7.07 The employees at the company's head office in Ottawa were separated into COR groups for purposes of toll control.

7.08 COR numbers were assigned to the various workers as follows:

**COR 1:** Executive. The executive level can access all trunk groups, including the international network.

**COR 2:** Upper Management. This level can access WATS, FX, Tie and Local Trunks, and can access the SCC office.

**COR 3:** Middle Management. This level can access the FX, Tie, and local trunks, and can access the **SCC** office, and free calls to any area.

**COR 4:** Technical Staff. This level can access the FX, Tie, and Local Trunks. .

**COR 5:** Administrative Staff. This level can access the Tie, and Local Trunks.

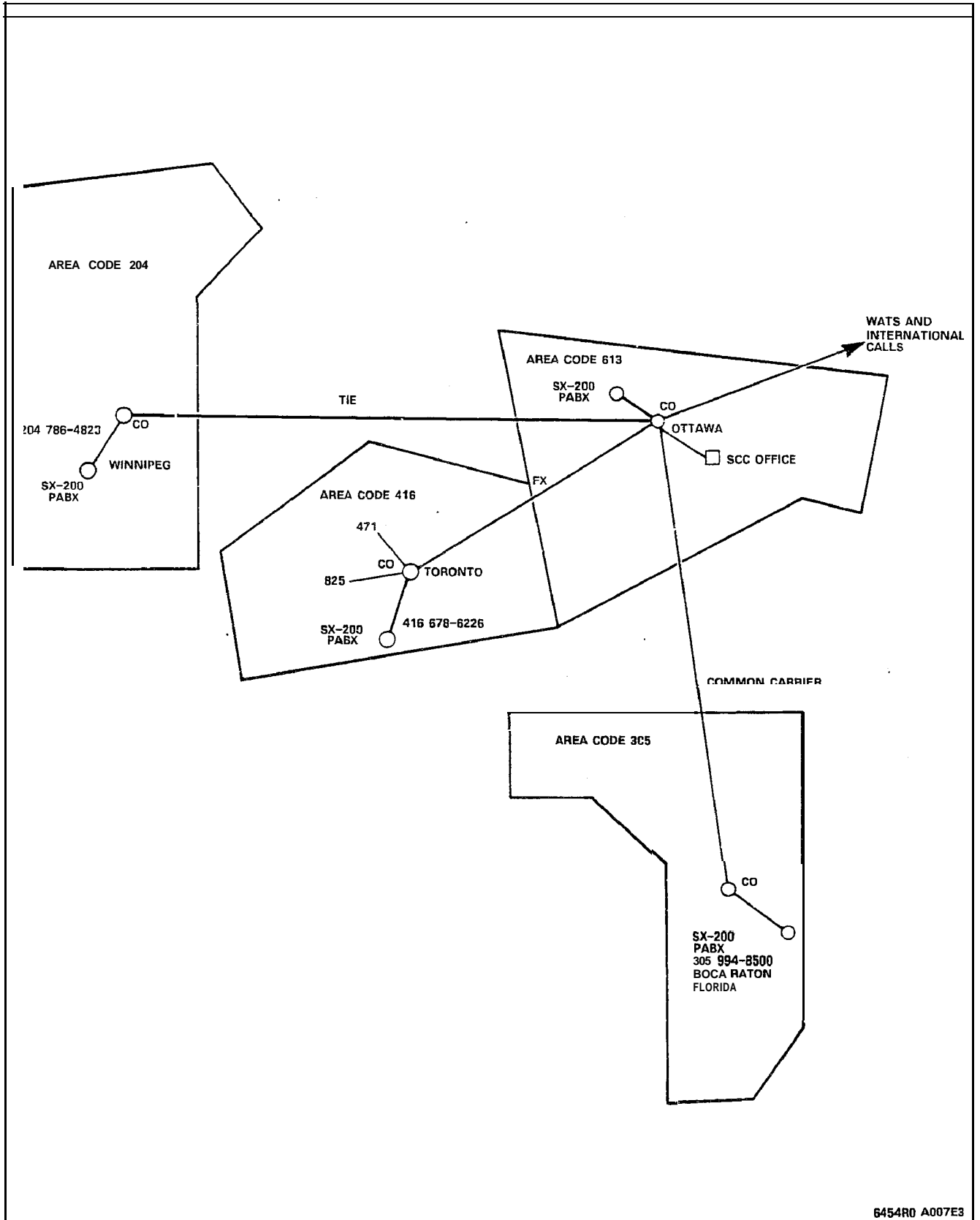
7.09 For all other stations not previously assigned, the following COR was given:

**COR 6:** This level can access the internal network only.

**Note:** It should be remembered that toll control can be applied not only to individual digit strings, but to trunk groups as well. An example of this is described later in this scenario.

### **ARS Form Filling**

7.10 Because ARS involves trunks and trunk groups (both incoming and outgoing), the **SX-200<sup>®</sup>** DIGITAL PABX forms concerning trunks and trunk groups must first be completed before starting the ARS tables.



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Figure 7-1 Trunking Network

7.11 The ARS tables in Figures 7-2(a) and 7-2(b) have been completed using the raw data produced in this scenario. The order in which they were completed is the order in which they would normally be programmed. A detailed description of the contents of the tables is given in the paragraphs immediately following Steps 1 through 3.

Step 1

7.12 Complete the COR Group Definition table, listing in each COR Group the COR members to be included. The COMMENTS field may include reminders concerning which level within the company is contained within each group, or comments concerning the destinations being restricted by each COR Group.

7.13 Complete the Day Zone table to provide day zones which satisfy the effect of changing rates for the trunk groups involved.

Step 2

7.14 Complete the Modified Digits table. This table instructs the system as to which digits should be outpulsed, and which should be absorbed by the system. Therefore, for example, if the "outside line" access code 9 is not to be outpulsed, the system should be instructed to delete the leading digit 9 from any digit string being analyzed. Similarly, if long-distance DDD calls are permitted, the system could be instructed to insert the digit 1 into the digit string, after 9 had been deleted. Since in this scenario it is known that (the SCC network will be accessed, the system can be told to insert the SCC number and account code. The user would then simply dial a 7-digit telephone number (in this case, the office in Boca Raton). Digit modification need not consider specific user-dialed digit strings, but the various dialing possibilities MUST be considered.

7.15 Complete the Route Definition table. Determine how many routes are available for the given trunks, and complete the table accordingly. For example, if Trunk Group 1 has five routes available, each route must appear on this table, with its own Route Number.

7.16 Complete the Route List Definition table. Assign each route defined a level of "choice". If Trunk Group 1 has five routes available, order these according to First, Second, Third, Fourth and Fifth choices. The priority of the routes is normally dependent on cost.

7.17 Complete the Route Plan Definition table. This will permit the system to select a route list on the basis of fluctuating costs due to time of day and day of the week. The hours at which the rates change must be entered in the START HOUR column.

Step 3

7.18 List the leading digits which are to be considered valid by the system; i.e., those which satisfy the customer's required access to the public network. The following order is recommended: (1) direc-

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tory inquiry numbers and local office codes; (2) codes which provide unrestricted access to toll routes (i.e., 0 and 01); (3) specific toll route codes; (4) tie lines; (5) FX lines; (6) WATS lines; (7) calls to be **completed** via specialized common carriers. As each leading digits string is entered, specify the number of digits to follow in the "QTY TO FOLLOW" column.

7.19 Complete the nested digit strings table. Digit strings index a route, route list, or route plan depending on the type of call initiated by the digit string. Analyze each digit string individually and complete the nested digit strings table accordingly, ensuring that each digit string terminates appropriately (route, list, or plan).

### ARS Digit Strings

7.20 The contents of the ARS Digit Strings tables have been composed in accordance with the requirements of the scenario. Each entry is described below.

**7.21** The leading digit has been specified as 9, which, in this scenario, represents the trunk access code of the PABX. Return dial tone is not required, therefore NO is specified in the "RETURN DIAL TONE" field.

7.22 Entries 1 and 2 contain digit strings which define free service calls to any area code, using the **wildcard** digits NOX and NIX. These calls are completed over local trunks, and so only one Route is required (Route 9).

7.23 Entries 3 through 5 contain the complete digit strings for emergency services, repair services, and directory assistance. As such, there are no digits to follow, and a 0 is placed in the "QTY TO FOLLOW" column. These calls can only be completed over one route (i.e., local trunks), and are therefore assigned to the first available route (ROUTE 1), in the Route Definition table.

7.24 Entries 6 through 12 contain a cross section of office codes in the Ottawa area. In reality, it is likely that all office codes would have to be listed. The number of digits to follow in each case is four; i.e., the remaining number of digits required to complete a local call. These calls can only be **completed** over one route; i.e., local trunks. A route (Route 1), having the same trunk group, COR and digit modification requirements as those required for entries 4 through 10 has previously been defined. Therefore, ROUTE 1 can be entered in the "TERM TYPE AND NUM" column of these entries.

7.25 Entry 13 provides an example of how access to an individual telephone number **can** be controlled. Access to this number (a local stockbroker) is restricted to the executive level by indexing it to a route (ROUTE 2) which is associated (through COR Group 3) with COR 1. The number of digits to follow is 0.

Automatic Route Selection and Toll Control

AUTOMATIC ROUTE SELECTION DIGIT STRINGS TABLE				
LEADING DIGITS: 5		RETURN DIAL TUNE (YES/NO): Y	COR GROUP:	
DIGITS TO BE ANALYSED	QTY TO FOLLOW	TERMINATION TYPE AND NUMBER		
1 NOx5551212	0	R	9	
2 N1x5551212	0	R	9	
3 911	0	R	1	
4 411	0	R	1	
5 611	0	R	1	
6 443	4	R	1	
7 445	4	R	1	
8 643	4	R	1	
9 662	4	R	1	
10 830	4	R	1	
11 832	4	R	1	
12 592	4	R	1	
13 5928246	0	R	2	
14 0	0	R	2	
15 01	unknown	R	2	
16 2047804823	0	L	1	
17 624	4	R	3	
18 3059448500	8	P	1	
19 416678	4	P	2	
20 416471	4	P	2	
21 416825	4	P	2	
22 416	7	P	3	
23 514	7	P	3	
24 705	7	P	3	
25 819	7	P	3	

CALL 1

CALL 2

CALL 3

TRUNK GROUPS: 1 = LOCAL TRUNKS  
 2 = ZONE 2 WATS,  
 3 = FX LINE  
 4 = TIE LINE

COR ASSIGNMENT:

COR 1 = ALL TRUNKS  
 COR 2 = WATS,FX,TIE,SCC.  
 COR 3 = FX,TIE,SCC  
 COR 4 = FX,TIE  
 COR 5 = TIE  
 COR 6 = INTERNAL CALLS ONLY

ROUTE PLAN TABLE						
PLAN 01	DAY ZONE 1		DAY ZONE 2		DAY ZONE 3	
T/ZONE	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST
01	8	2	8	2	5	3
02	12	2	12	3	12	3
03	18	3	18	3	18	3
04						
05						
06						

ROUTE PLAN TABLE						
PLAN 02	DAY ZONE 1		DAY ZONE 2		DAY ZONE 3	
T/ZONE	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST
01	8	4	8	4	8	5
02	12	4	12	5	12	5
03	18	5	18	5	18	5
04						
05						
06						

ROUTE PLAN TABLE						
PLAN 03	DAY ZONE 1		DAY ZONE 2		DAY ZONE 3	
T/ZONE	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST	START HOUR	ROUTE LIST
01	8	7	8	7	8	6
02	12	7	12	6	12	6
03	18	6	18	6	18	6
04						
05						
06						

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Figure 7-2(a) Table Network (Part 1)

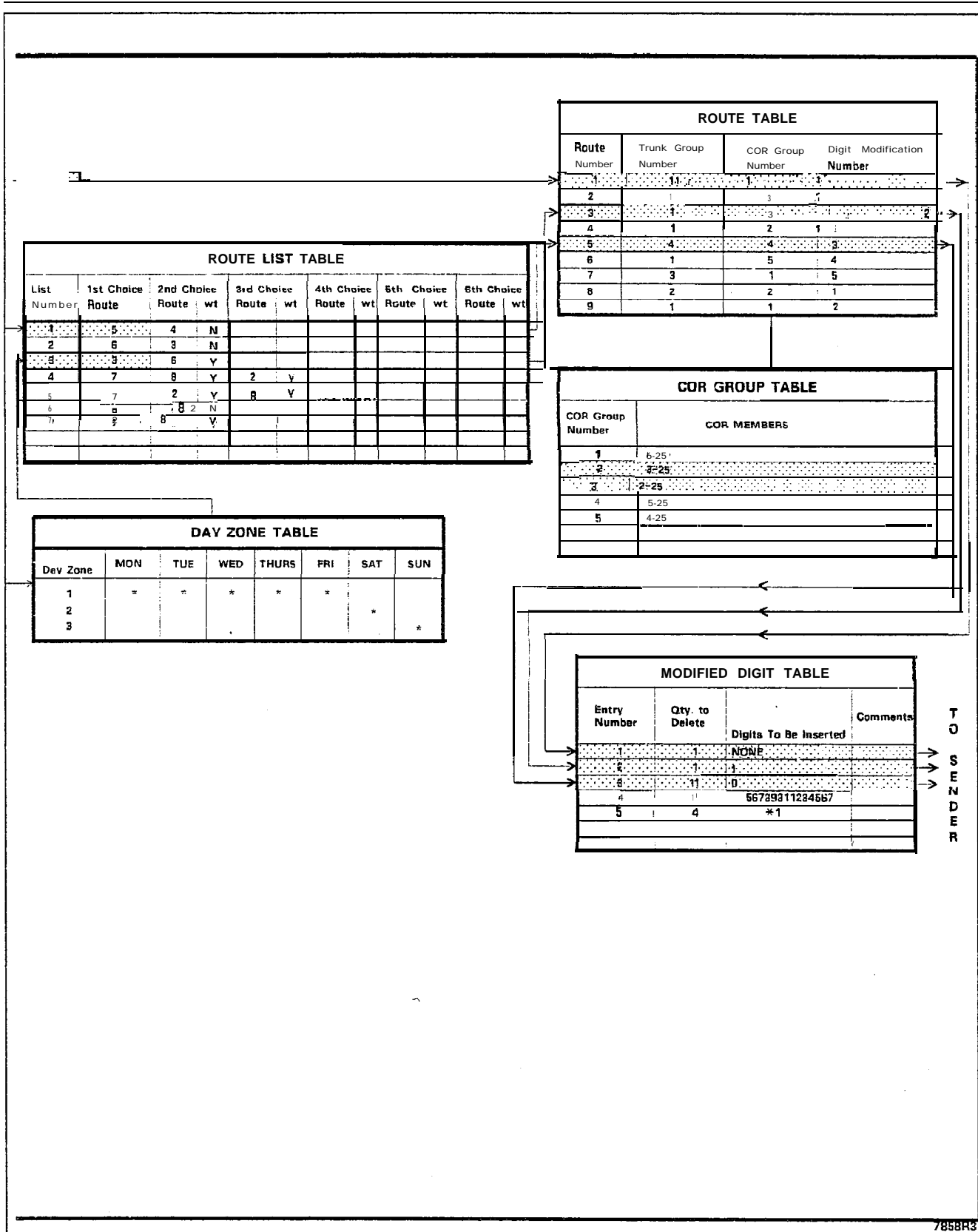


Figure 7-2(b) Table Network (Part 2)



7.26 Entries 14 and 15 contain digits which allow unlimited access to the toll call network; i.e., digit 0 for operator assistance, and 01 for access to the international network. The number of digits to follow for entry 12 is 0. The number of digits to follow for entry 13 is UNKNOWN, since it is dependent on the call destination. The "QTY TO FOLLOW" entry for this string therefore contains the word UNKNOWN. A route, ROUTE 2 exists, and satisfies the COR and digit modification requirements for entries 12 and 13. ROUTE 2 is therefore entered in the "TERM TYPE AND NUM" column of these entries.

7.27 Entry 16 contains the complete digit string for the service office in Winnipeg. As such, the number of digits to follow is 0. This call can be completed over either of two routes: the Tie Trunk, or DDD. Since these routes are not time-dependent (Tie Trunks are always less expensive than DDD), a LIST ("LIST 4") is defined in the "TERM TYPE AND NUM" column.

7.28 Entry 17 is an example of a toil number within the home area, and therefore a new digit modification sequence must be defined which inserts the toll digit 1 prior to outputting. This digit modification sequence is defined in entry 2 of the Modified Digits table, and it is referenced from a newly defined route within the Route Definition table (Route 3).

7.29 Entry 18 contains the digit string which defines the number of the plant in Boca Raton. Calls to this destination can be completed over two routes: SCC or DDD. The tariff structure for SCC is similar to WATS in that SCC is less expensive than DDD during business hours. As such, the two routes for entry 16 are indexed via the Route Plan table and Route List Definition table. The number of digits to follow is 0 and the first available route plan is route plan 1.

7.30 Entries 19 through 21 contain the digit strings which define toll routes to specific COs within area code 416. The number of digits required to complete a call to any of these offices is 4. These calls can be completed over any one of three routes, namely, FX, WATS, or DDD. These routes are time-dependent (i.e., during some times WATS is less expensive than DDD, and at others, DDD is less expensive), and as such, they are indexed to PLAN 2 in the "TERM TYPE AND NUM" column.

7.31 Entry 22 contains a digit string which defines the area code 416. The digits to follow can be any combination of seven digits. This provides a user, having the required COR, with unrestricted access to any CO within the area defined by area code 416. Like entries 19 through 21, these calls can be completed over any one of three routes which are time-dependent. However, unlike entries 19 through 21, user access is not restricted to specific COs, and therefore an additional set of routes having the relevant CORs is required. Consequently, additional Route Lists are required to list the new routes, and hence an additional Route Plan is required to associate the new route lists with day and time zones. PLAN 3 is therefore entered in the "TERM TYPE AND NUM" column.

7.32 Entries 23 through 25 contain digit strings which define the three area codes which, in conjunction with entry 22, define the area codes accessible through Zone 2 WATS. Unlike entry 22, calls made via entry 23 through 25 can only be completed over either of two routes: WATS, or DDD. These two routes are time-dependent and are therefore indexed to PLAN 3 in the "TERM TYPE AND NUM" column.

#### Route Definition Table

7.33 Calling devices which are routed to Route 1 from the ARS Digit Strings tables are allowed to complete calls over the CO Trunk Group 1 if they are part of COR Group 2. The digit modification sequence for such calls is defined in Modified Digits table entry 1. Similarly, devices are routed via routes 2 through 9 from the Route List table.

#### Route List Table

7.34 List number 1 is referenced from the ARS Digit Strings table. it provides alternate routing by listing two routes: Route 4 and Route 5. The routes are listed in order of cost (i.e., route 4 is identified in the Route Definition Table as the Tie Line between Ottawa and Winnipeg), and as such it is always less expensive than the alternative DDD route defined by route 5.

7.35 List numbers 2 and 3 are referenced from the Route Plan 1. Within that plan they are assigned to time zones such that for any given time zone they define the least cost routing. Each entry lists two routes: routes 3 and 6 (route 3 being DDD and route 6 being identified within the Route Definition Table as SCC).

7.36 List numbers 4 and 5 are referenced from Route Plan 2. They list three routes (2, 7 and 8) in order of cost for the Day and Time zones defined within Route Plan 2.

7.37 List numbers 6 and 7 are referenced from Route Plan 3. They are similar to entries 4 and 5 with the exception that the FX line is not included.

#### Route Plan Table

7.38 Route Plans 1 through 3 are referenced from the ARS Digit Strings tables. They assign Route Lists to the day and time zones which are defined in the associated Day Zone table. in Route Plan 1, least cost routing is provided by Route List 2 during Day Zone 1, Time Zones 1 and 2, and Day Zone 2, Time Zone 1, and by Route List 3 in the remaining day/time zones.

#### Day Zone Table

7.39 The Day Zone Table defines three day zones and three time zones. These are combined in the route plan table to form nine day and time zones.

7.40 In this scenario, three trunk groups are time-dependent: the WATS lines and the CO and SCC trunks. The tariff structure for these two groups is such that WATS is less expensive than DDD on Monday through Friday from 08:00 - 18:00 and on Saturday from 08:00 - 12:00.

#### **COR Group Definition Table**

7.41 All entries in the COR Group Definition table are referenced from the Route Definition table. Group 1 contains CORs 6, through 25. Thus, peripheral devices which have been assigned any of these CORs are restricted from completing calls via routes which reference COR Group 1. Similarly, COR Groups 2 through 5 define different levels of service.

#### **Modified Digits Table**

7.42 All entries in the Modified Digits table are referenced from the Route Definition table. Entry Number 1 is associated with digit strings in the ARS Digit Strings table where the digits to be outpulsed are identical to those dialed by the user. As such, only the leading digit of the string is absorbed and no digits need be inserted.

7.43 Entry Number 2 is associated with digit strings in the ARS Digit Strings table which represent toll calls and therefore require the leading digit to be absorbed and the toll digit 1 to be inserted.

7.44 Entry Number 3 is associated with digit strings in the ARS Digit Strings table which are outpulsed over the Tie Line to Winnipeg, and as such, all digits dialed by the user are deleted and a 0 for the distant attendant is inserted.

7.45 Entry Number 4 is associated with calls which are completed via the SCC link. The SCC account code is inserted in the digits to be outpulsed.

7.46 Entry Number 5 is associated with the digit strings in the ARS Digit Strings table which are outpulsed over the FX Line to Toronto. The first four digits are deleted and a dial tone marker is inserted in the "Digits to be Inserted" column

## 8. SYSTEM PROGRAMMING

8.01 When the paper forms are complete, the data must be entered into the system memory through the CDE terminal or Attendant Console. This is part of the Customer Data Entry process, described in Section MITL9108-093-2 1 0-NA, Customer Data Entry.

**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
STATION MESSAGE DETAIL RECORDING**

CONTENTS	PAGE
1. INTRODUCTION .....	1-1
General .....	1-1
Reason for Issue .....	1-1
Brief Description .....	1-1
2. DETAILED DESCRIPTION .....	2-1
General .....	2-1
Recorded Information .....	2-1
Call Record Examples .....	2-6
Call Timing .....	2-8
3. EXTERNAL DEVICES .....	3-1
General .....	3-1
Printer .....	3-1
Tape Machine .....	3-1
4. INSTALLATION .....	4-1
General .....	4-1
Cabling .....	4-1
5. SMDR PROGRAMMING AND CONTROL .....	5-1
General .....	5-1
SMDR Programming Options .....	5-1
6. SMDR LOGS AND DATA ROUTING .....	6-1
7. OPERATIONAL PARAMETERS .....	7-1
General .....	7-1
Non-Recording Conditions .....	7-1
Attendant-Handled Calls .....	7-1
Incoming Calls .....	7-2
APPENDIX A	
ACCOUNT CODES .....	A-1

**LIST OF TABLES**

<b>TABLE</b>	<b>TITLE.</b>	<b>PAGE</b>
2-1	Summary of Fields In SMDR Records , . . . . .	2-2
3-1	Character Set . . . . .	3-2
5-1	CDE-Selected SMDR Class of Service and System Options . . . . .	5-2

**LIST OF CHARTS**

<b>CHART</b>	<b>TITLE</b>	<b>PAGE</b>
2-1	SMDR Printouts . . . . .	2-7

## 1. INTRODUCTION

### General

1.01 This document describes the Station Message Detail Recording (SMDR) feature of the SX-200<sup>®</sup> DIGITAL Private Automatic Branch Exchange (PABX). The document includes a detailed description of the feature, its programming and its operational parameters. The installation of the external devices (e.g., printer) should be obtained from the product-related documentation.

### Reason for issue

1.02 This Section is issued to describe the SMDR feature of the SX-200<sup>®</sup> DIGITAL PABX with Generic 1000 or Generic 1001 software and its associated options. This practice was formerly Section MITL9108-093-451-NA, Issue 1. The numbering has been changed as part of a documentation rationalization program. Change bars have been included to show the changes from the last issue of Section MITL9 108-093-45 1 -NA.

### Brief Description

1.03 The Station Message Detail Recording, or "call detail recording", feature of the SX-200<sup>®</sup> DIGITAL PABX, is an integral part of the system which generates a descriptive call record for every incoming and outgoing trunk call made via the PABX. These call records can be routed to an RS-232 port for processing or printing. They allow the customer to evaluate the use of the system's trunks and hence determine whether the quantity and type of trunks is the most economical mix for the traffic being handled by the PABX. In addition, the customer can analyze the use of the trunk network by corporate personnel. Misuse can then be corrected through modifications to the toll control assignment.



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## 2. DETAILED DESCRIPTION

### General

2.01 The SMDR data collection process is initiated every time a trunk (incoming or outgoing) is seized. The collection process forms part of the system's call processing routines; as such, data is collected on a per-call basis for the duration of each call. The data is formatted into an SMDR record and is routed to an RS-232 output port. The records can be routed directly to the output port as described in Part 3 of this Practice.

2.02 When SMDR (outgoing and incoming) is selected, a record is generated for every trunk call regardless of the call duration, the identity of the originating party or whether the call is completed. When two or more trunks are involved in a call, a separate record is generated for each trunk, thus allowing each trunk to be analyzed for costing purposes. When a station which is involved in a trunk call invokes a transfer to another station, only one record is generated, however, the number of the second station appears in the SMDR call record.

2.03 An SMDR record is not generated for: (1) calls which encounter busy trunks; (2) internal calls between stations or between a station and the Attendant; or (3) calls made from stations or going to trunks whose class of service includes SMDR disable.

### Recorded Information

2.04 Each SMDR call record occupies a single line comprising 85 or 88 characters; the latter accommodates a 3-digit system identifier. The information which can be included in a call record is as follows:

- Call Start time
- Calling party
- Called party
- Call duration
- Call completion status (e.g., called number busy)
- Digits dialed on the trunk (maximum 26 digits)
- Meter pulses (optional)
- Outgoing and incoming trunk numbers
- System identity (optional)
- Long calls identified
- Time to answer incoming calls
- Identifies the second station in a transfer or in a conference
- Identifies conferences and transfers
- Indicates when the Attendant was involved in the call.

2.05 The definition of the data and its position in the record is given in Table 2-1. The table has five columns: the first identifies the data; the second defines the data's position within the record; the third indicates the format of the data; the fourth describes the data; and the fifth provides additional notes.

Station Message Detail Recording

TABLE 2-1  
SUMMARY OF FIELDS IN SMDR RECORDS

Name	Columns	Format	Definition	Notes
Long Call	1	z	- = 5-9 min % = 10-29 min + = 30 or more min	
Date	2-6	mm/dd	mm = Month dd = Day	mm = 01-12 dd = 01-31
Spacer	7		- = Space	
Start Time	8-13	hh:mm	hh = Hours mm = Minutes	00-23 00-59
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 Number (CO) Xnnn = Trunk Number (Non-CO) mmmm = Attendant Console Directory Number	c = 0-9, *, # nnn = 000-999  m = 0-9
Spacer	28		- = Space	
Attendant	29	f	* = Attendant - = Attendant not involved	Attendant answered or initiated the call, then transferred it to an extension
Leading Digits	30-33	gggg	cccc = Access Code (outgoing and tandem calls only)	C = 0-9, *, # Left-justified.
Time to Answer (Alternate)	30-32	ttt	ttt = Time in seconds (000-999) *** = Call unanswered	<b>Leading zeroes output.</b> Incoming calls only.
Digits Dialed on the trunk	34-59	xx ... x	Up to 26 (20 if metering) digits <b>dialed</b> on the trunk	x = 0-9, *, or # private speed call numbers are not recorded.

TABLE 2-1 (CONT'D)  
SUMMARY OF FIELDS IN SMDR RECORDS

Name.	Columns	Format	Definition	Notes
Meter (Optional)	55-59	m m m m	m m m m = Number of meter pulses	m m m m = 00000 to 6400 Leading zeroes outputted
Call Completion Status	60	h	A = Answer Supervision B = Callee is Busy E = Caller Error T = TAFAS answered	Outgoing Incoming Direct/Dial-In Incoming/Dial-In Incoming Incoming/Outgoing
Speed Call or Call Forward Flags	61	C,R, or F.	C = Number was Speed called (ARS implied) F = Forwarded through External Call Forward R = default (ARS implied)	Outgoing All trunk calls are ARS by default.
Called Party	62-65	q q q q	cccc = Extension Number Tnnn = Trunk Number (CO) Xnnn = Trunk Number (Non-CO) m m m m = Attendant Console Directory Number	C = 0-9, *, # nnn = 001-200  m = 0-9
Transfer/Conference Call	66	K	T = Supervised Transfer X = Unsupervised Transfer C = 3-Way or Conference	
Spacer	67		-- =Space	
Third Party	68-71	r r r r	cccc = Extension Number	c = 0-9, *, #
Spacer	72		-- =S p a c e	
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	l i f	Entered by System ID	i = 0-9 l i f = 000-999 000 = "No Code entered"

2.06 A description of the call record fields detailed in Table 2-1 is as follows:

**Long Call Indicator (z).** This optional field contains a dash (-) for calls of duration 5 to 9 minutes 59 seconds, a percent symbol (%) for calls of duration 10 to 29 minutes 59 seconds, or a plus symbol (+) for calls of 30 or more minutes. This is useful when records are to be scanned manually.

**Date (mm/dd).** The date is reported numerically as a 2-digit month followed by a 2-digit day. The year is not reported.

**Start Time (hh:mm).** The start time of a call is reported in hours and minutes. A 24-hour format is employed.

**Duration of Call (hh:mm:ss).** The call duration is reported in hours, minutes and seconds. Leading zeroes are output (Maximum time = 23 hours, 59 minutes, 59 seconds).

**Calling Party (pppp).** This is the identity of the party that originated the call. If a 5-digit extension numbering plan is used, only the last four digits will be used by SMDR to identify the calling party. It may be a station, the Attendant, or an incoming trunk, as described below:

- (a) Station Number as Calling Party (cccc). A station number may be one to four digits (0-9, \*, #) which are left-justified; i.e., no leading zeroes.
- (b) Attendant as Originating Party. Calls originated by the Attendant, which do not **involve** a third party, report a calling party of **the** console directory number. When the console number is in the range 10 through 99, the format is modified to be **ATmm**. If the Attendant calls an outside party on behalf of a station or trunk, that station or trunk is reported as the caller but the Attendant Flag symbol \* appears in the "Attendant was Involved" field.
- (c) Trunk Number as Calling Party (Tnnn or Xnnn). When the originating party is an incoming CO trunk, "Tnnn" appears on the record, where "nnn" is the number of the trunk. When the originating party is an incoming **non-CO** trunk, "Xnnn" appears in the record trunks. The "T" or "X" ensures that this number and CO Attendant trunks may be distinguished from tie trunks. The trunk number is the trunk ID specified during customer data entry in the Trunk Assignment tables

**Attendant (f).** This 1-digit field contains an asterisk (\*) when a call is originated by or initially answered by the Attendant. This flag will not appear when a call is transferred to the Attendant.

**Time to Answer (ttt).** This is the number of seconds from the time the incoming trunk is seized, until the call is answered. If the call is **never** answered, this field displays **\*\*\***. It applies to

incoming calls only. Leading zeroes are output and the field remains at 255 when an overflow is reached.

Leading Digits (up to 5 ARS leading digits). This field applies to outgoing calls. For incoming calls this field reports Time to Answer (see above). Leading digits correspond to digits programmed in the ARS digit string form during CDE. Leading digits reported may be from one to four digits long (O-3, \*, #) (only the first 4 of 5 digits are reported). The field is left-justified and space filled.

Digits Dialed on the Trunk (xxx---x). The maximum number of digits (O-9, \*, #) recorded is 25. When the SMDR Meter Pulse On option is selected, this number is reduced to 20. This field does not include the trunk group access code on outgoing calls. The digits recorded are the actual digits outputted on the trunk after digit modification has been performed. On dial-in trunk calls, the digits dialed in on the trunk are recorded. When more than 25 digits are dialed, the 25th digit is overwritten.

Meter Pulses (mmmmm). The number of reversals (i.e., meter pulses) received from an outgoing trunk can be recorded when this option is selected. The range is 0 to 64000. Leading zeroes are output. The maximum number of digits recorded reduces from 26 to 20. The trunk group must be programmed for "Answer Supervision". Meter pulses are not recorded for other trunk groups.

Call Completion Status (h) (Outgoing Calls). This field is used to report the completion status of an outgoing call in so far as the PABX is able to determine it. When the trunk group is programmed to receive "Answer Supervision" and a supervision is received, an "A" is reported.

Call Completion Status (h) (Incoming Calls). The PABX can monitor the outcome of the call, and thus, can provide a comprehensive report on the calls completion. From a dial-in trunk, but not a direct-in-line trunk, if the station or hunt group to which the call is directed is busy, a "B" is recorded. When 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. When an incoming call is forwarded by the Attendant to a busy station, a "B" appears in the call completion status field, the number called appears as the third party, and the Attendant appears as the called party.

Speed Call or Call Forward Flags (C,R, or F). This field contains a "C" when the number is speed dialed, and an F when the call is forwarded through the external call forward feature; otherwise, R will appear.

Called Party (qqqq). This is the party to whom the call is directed. It may be an station number, the Attendant or for

outgoing calls, the 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). For incoming calls to the Attendant, the called party is recorded as the Attendant unless the Attendant transfers it to a station. For direct-in lines, it would be the station number. On outgoing calls handled by the Attendant, the called party would be the trunk number which the call went out on.

Transfer/Conference Call (K). This field identifies calls that involve three or more parties. It contains a "T" for supervised transfers, "X" for unsupervised transfers (Le., dead transfer or transfer into busy) and a "C" for 3-way conversations and conferences.

Third Party (rrrr). The third party field contains the number of the station to which a trunk call has been transferred. When several transfers take place during a trunk call, the first party is the only one reported. The format is identical to that of the Calling Party (pppp).

Account Code (aa...a). Account codes are typically used to charge the cost of calls either to internal departmental cost centers or to project accounts for billing to specific projects. 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 (the default value is six digits).

System identifier (iii). This optional S-digit field may contain values from "000" to "999". "000" indicates that no identifier has been entered.

#### Call Record Examples

2.07 Examples of typical SMDR call records are shown in Chart 2-1.

CHART 2-1  
SMDR PRINTOUTS

0 1 2 3 4 5 6 7 8 9  
12345678901234567890123456789012345678901234567890123456789012345678901234567890

EXAMPLE 1: 2-PARTY OUTGOING CALL

-06/13 11:42 00:08:29 2 1 4 9 16135922122 ART054 000

On June 13th at 11:42 AM, Extension 214 obtained Trunk Number 54 and dialed "1-613-592-2122". Answer supervision was provided. The conversation lasted 8 minutes, 29 seconds.

0 1 2 3 4 5 6 7 8 9  
12345678901234567890123456789012345678901234567890123456789012345678901234567890

EXAMPLE 2: Z-PARTY OUTGOING CALL

05/17 10:51 00:01:52 213 9 201 ARX082 000

On May 17 at 10:51 AM, Extension 213 accessed an identified trunk group, then 201 to obtain an extension in the other PABX. The other PABX provided supervision and the conversation lasted 1 minute, 52 seconds. The trunk number was 082.

0 1 2 3 4 5 6 7 8 9  
12345678901234567890123456789012345678901234567890123456789012345678901234567890

EXAMPLE 3: 2-PARTY INCOMING CALL

01/30 15:10 00:02:22 T 1 0 2 0 0 8 2 0 1 201 000

On January 30 at 3:10 PM, incoming Direct-in Trunk Number 102 rang in to Extension 201. The extension answered after 8 seconds and they talked for 2 minutes, 22 seconds.

0 1 2 3 4 5 6 7 8 9  
12345678901234567890123456789012345678901234567890123456789012345678901234567890

EXAMPLE 4: 2-PARTY INCOMING CALL

03/12 09:11 00:01:12 x 1 1 6 007 6 3 224 000

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.

0 1 2 3 4 5 6 7 8 9  
12345678901234567890123456789012345678901234567890123456789012345678901234567890

EXAMPLE 5: ATTENDANT-HANDLED CALL " OUTGOING TRUNK

+01/30 15:27 00:35:11 2 0 1 " 9 16545996951 ART052 000

On January 30, Extension 201 dialed the Attendant and asked for an outside line. The Attendant dialed 1-654-599-6951. At 3:27 PM, the other party answered and the conversation lasted 35 minutes, 11 seconds. Trunk Number 52 was used.

**CHART 2-I  
SMDR PRINTOUTS (CONT'D)**

0	1	2	3	4	5	6	7	6	9
12345678901234567890123456789012345678901234567890123456789012345678901234567890									

EXAMPLE 6: ATTENDANT-HANDLED CALL ~ INCOMING TRUNK

04/05	13:42	00:00:31	T O 9 0 0 0 9					1234	000
-------	-------	----------	---------------	--	--	--	--	------	-----

On April 15th at 1:42 PM, Trunk 90 rang into the Attendant. After 9 seconds, the Attendant at 1234 answered. The trunk party spoke to the Attendant for 31 seconds, then hung up.

0	1	2	3	4	5	6	7	8	9
1234567890123456789012345678901234567890123456789012345678901234567890~2345678901234667890									

EXAMPLE 7: CALLING EXTENSION TRANSFER CALL

04/02	09:36	00:04:55	103 9 5922122					RT162T100	000
-------	-------	----------	---------------	--	--	--	--	-----------	-----

On April 2nd at 9:36 AM, Extension 103 dialed a trunk access code 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 Number 162 was used for the call.

0	1	2	3	4	5	6	7	8	9
1234567890123456789012345678909234567890123456789012345678901234567890~234567890~234567890									

EXAMPLE 8: CALLED EXTENSION TRANSFER CALL

03/12	07:42	00:03:06	T162 *003					241T 2 1 5	000
-------	-------	----------	-----------	--	--	--	--	------------	-----

On March 12th at 7:42 AM, Trunk 162 rang the console and requested to speak to Extension 241. The Attendant 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.

**Call Timing**

**2.08** The timing functions which apply to incoming and outgoing calls are described as follows:

**Incoming Call** - Three aspects, related to the timing of an incoming call, are recorded on a SMDR call record; i.e., the date, the time taken for the called party to answer and the duration of the call. The time to answer is the difference between the time when the called device is seized and the time when the called party answers. The duration of the call is the difference between the time when the call is answered and the time when the call is released; i.e., call cleardown.

**Outgoing Call** - Three aspects, related to the timing of an outgoing call, are recorded on an SMDR call record; i.e., the date, the call start time and the call duration. The latter is only recorded for calls which are answered. The call start time is recorded as either the time when the called device is seized, or,



in the case of answer supervision, the time when the called device is answered. Call answer is determined by an answer supervision signal provided by the trunk. The call duration is the difference between the time when the call is answered and the time when the call is released; i.e., call clear-down.

### 3. EXTERNAL DEVICES

#### General

**3.01** SMDR records are output from the SX-200<sup>®</sup> DIGITAL PABX in the standard RS-232 format. Any RS-232 compatible device can be connected directly to the system for the storage of records.

#### Printer

**3.02** A summary of the parameters which must be available from an SMDR printer is as follows:

- 132 character line length
- 300 baud to 9600 baud
- a subset of ASCII characters, as shown in Table 3-1.

The baud rate of the SX-200<sup>®</sup> DIGITAL printer port is selectable from the Maintenance Terminal (refer to Section MITL9108-093-351-NA, RS-232 Maintenance Terminal). Ensure the baud rate of the printer matches that selected at the Maintenance Terminal.

#### Tape Machine

**3.03** Any tape machine which is capable of operating over an RS-232 interface can be connected to the SMDR output port of the SX-200<sup>®</sup> DIGITAL PABX.

Station Message Detail Recording

TABLE 3-1  
CHARACTER SET

BIT NUMBERS								0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1
b7	b6	b5	b4	b3	b2	b1	COLUMN	0	1	2	3	4	5
							ROW						
			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. INSTALLATION

### General

**4.01** The data formatting of SMDR records is an integral part of the system which does not require additional hardware or hardware modification. Installation is therefore simply a matter of connecting a compatible printer or terminal to the output port of the system.

### Cabling

**4.02** The printer or terminal should be located within 15.2 m (50 ft) of the SX-200<sup>®</sup> DIGITAL PABX. Failure to observe this caution may cause the SMDR record to be corrupted. The printer or terminal can be connected directly to the RS-232 port. SMDR data is automatically routed to this port.

---

## 5. SMDR PROGRAMMING AND CONTROL

### General

5.01 The operation of the SMDR feature is determined by the way the feature is programmed during initial installation of the system. The programming of the SMDR feature forms part of the System and Class of Service Options programming known collectively as Customer Data Entry (CDE). The operation can be modified at any time by the maintenance person from the CDE terminal. Table 5-1 shows the SMDR options involved. A description of these options is given below. A complete description of the CDE forms is given in Section MITL9108-093-210-NA, Customer Data Entry. For a record of an outgoing call to be generated, SMDR must be enabled in CDE Form 16, Trunk Groups. A device accessing a Trunk Group with SMDR enabled will generate an SMDR record unless the COS option "SMDR Does Not Apply" is enabled in that device's Class of Service.

### SMDR Programming Options

5.02 The SMDR Programming Options are as follows:

- **Record Incoming Calls:** This option enables SMDR for incoming trunk calls.
- **Record Meter Pulses:** This option causes meter pulses generated by the Central Office to be counted and then reported in the SMDR record.
- **Drop Calls Less Than n Digits:** When this option is enabled, outgoing calls of less than n digits are not reported (where n is programmed to be between 0 and 11). In Generic 1000, n is 8; in Generic 1001, n is programmable.
- **Drop Incomplete Outgoing Calls:** When this option is enabled, incomplete outgoing calls are not recorded.
- **Extended Record:** When 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.
- **Overwrite Buffer:** When this option is DISABLED and all SMDR buffers are in use, outgoing calls requiring SMDR will not be allowed. When ENABLED, the OLDEST SMDR buffer waiting to be printed will be overwritten with the new outgoing call SMDR information.
- **Does Not Apply:** When this option is enabled, no calls will be recorded for the Class of Service in which it is enabled.
- **Indicate Long Calls:** When this option is enabled, calls of 5 minutes or longer are flagged in the SMDR record.

**Station Message Detail Recording**

**TABLE 5-1  
CDE-SELECTED SMDR CLASS OF SERVICE AND SYSTEM OPTIONS**

<b>OPTION</b>	<b>TYPE</b>	<b>NUMBER</b>
SMDR - Record Incoming Calls	COS	807
SMDR - Record Meter Pulses	COS	808
SMDR - Drop Calls < n Digits (n = 0...11, disable = 0)	COS	803
SMDR - Drop Incomplete Outgoing Calls	COS	804
SMDR - Overwrite Buffer	COS	806
SMDR - Does Not Apply	COS	700
SMDR - Indicate Long Calls	System	28

**6. SMDR LOGS AND DATA ROUTING**

**6.01** The routing of SMDR records is controlled by the maintenance person from the Maintenance Terminal. Records are automatically routed to a printer via the RS-232 port and may be routed to the maintenance terminal.

## 7. OPERATIONAL PARAMETERS

### General

7.01 The SMDR feature is transparent to the end user; hence there are no operational procedures to be employed by the Attendant or station user. The following provides a summary of the operational parameters which are described earlier in this document.

### Non-Recording Conditions

7.02 SMDR is not initiated under the following conditions:

- Busy tone is obtained by the Attendant or a station when a trunk is dialed (because all trunks in the group are busy).
- The calling or called party has a class of service which disables SMDR.
- Reorder tone is obtained by the caller.
- The Attendant intercepts a station attempting to access a trunk group.
- During a power failure condition no SMDR records are made.

### Attendant-Handled Calls

7.03 The following conditions are reported as shown when the Attendant handles a call:

- When the Attendant dials a trunk with no station or trunk involved, the calling party is the Attendant.
- Direct Trunk Access by the Attendant is reported. The Leading Digits field is left blank.
- When the Attendant answers a trunk call and does not transfer it to a station, the called party is the Attendant.
- When the Attendant dials a trunk while it has a station as its source, the calling party is reported as the station and an "\*" appears in the "Attendant was Involved" field.
- When the Attendant connects a previously held station to a trunk the calling party is the station and an "\*" appears in the "Attendant was Involved" field.
- If the Attendant makes an unsupervised transfer to an extension, the called party is the Attendant, and the extension appears as a third party.
- When the Attendant has a trunk as Source, and then connects a station to the trunk, the calling party is the trunk, the called



party is the station, and an "\*" appears in the "Attendant was Involved" field.

### Incoming Calls

**7.04** When SMDR is enabled for incoming calls 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. When the dial-in trunk dials an illegal or vacant number or hangs up before completing the number, the call is reported. The called party is the station dialed. The DISA Security Code is not reported.
- The called party is always the Attendant, except when the Attendant forwards the call to a station. The station then becomes the called party and an "\*" is reported in "Attendant was Involved".
- Direct-in trunks show the station number as the called party (i.e., dial-in trunks). However, the "Digits Dialed" field is blank. When the trunk is directed to a Hunt Group, the station that answered the call is reported.
- On incoming calls, an "E" is reported when the trunk hangs up while listening to reorder tone, or a "B" is reported when the trunk hangs up while listening to busy tone. A "T" is reported when the incoming call is answered with TAFAS.

## APPENDIX A

### ACCOUNT CODES

#### A1. INTRODUCTION

##### General

**A1.01** This Appendix provides the reader with an overview of account codes. It includes a general description of account codes, details of operation, and preparation of programming data.

#### A2. GENERAL DESCRIPTION

##### General

**A2.01** Account codes uniquely identify SMDR call records for billing purposes. Two types of account code length options (fixed length and variable length), can be programmed in the System Options form during Customer Data Entry. A fixed length account code is preprogrammed to be of a length between 4 and 12 digits. A variable length account code can be of any length between 1 to 12 digits. Variable length account codes must be terminated by a terminator digit as described in the following paragraph. When no account code length is specified during CDE programming, the default length is six digits.

**A2.02** The Verifiable Account Code feature is an optional enhancement of SMDR with Generic 1001 software only which provides unique codes with assigned COS and/or COR options. Dialing a verifiable account code will override the COS and/or COR assigned to a phone.

##### Account Code Terminator

**A2.03** The variable length account code terminator is the # digit. It is dialed at the end of a variable-length account code to indicate to the system that the account code is complete. A variable length account code cannot be dialed from rotary telephones since it is impossible to dial the terminator digit. If variable length is enabled, rotary telephone sets default to 6-digit account codes. The terminator is not required should a variable length account code of the full 12 digits be dialed.

##### Forced Account Codes

**A2.04** The Forced Account Code - External Calls feature is a COS option which is assigned to stations in order to bar trunk access from those stations, unless the access attempt is preceded by a valid account code. The Forced Account Code - Long Distance Calls feature is a COS option assigned to stations in order to bar certain

## Station Message Detail Recording

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long distance calls (identified in the ARS Digit Strings CDE form), unless the access attempt is preceded by a valid account code.

**A2.05** Forced account codes can also be assigned to DISA trunks via the COS of the special DISA trunk in order to force a validation check on incoming DISA calls. System dial tone is not returned to the caller until a valid independent account code is received.

### A3. OPERATION

#### **Account Code entry at the start of an outgoing call:**

- Lift handset – dial tone is returned.
- Dial the feature access code followed by the account code and terminator (#) (terminator not required when fixed length account codes are used).
- Dial the outgoing number.

#### **Account code entry during an incoming or outgoing call on a SUPERSET 4™ set:**

- Press SELECT FEATURES key.
- Dial feature "5" (Account Codes).
- Enter Account Code number.
- Press SAVE softkey.

**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
ABBREVIATED DIAL**

<b>CONTENTS</b>		<b>PAGE</b>
<b>1. GENERAL</b>		<b>1-1</b>
<b>Introduction</b>		<b>1-1</b>
<b>Reason for Reissue</b>		<b>1-1</b>
<b>2. ABBREVIATED DIAL AND SPEED DIAL DESCRIPTION</b>		<b>2-1</b>
<b>General</b>		<b>2-1</b>
<b>Personal Speed Dial Description</b>		<b>2-1</b>
<b>System Abbreviated Dial Description</b>		<b>2-1</b>
<b>System Tables</b>		<b>2-1</b>
<b>System Abbreviated Dial Access</b>		<b>2-2</b>
<b>Personal Speed Dial Access</b>		<b>2-2</b>
<b>3. PROGRAMMING</b>		<b>3-1</b>
<b>Personal Speed Dial</b>		<b>3-1</b>
<b>SUPERSET<sup>®</sup> Set</b>		<b>3-1</b>
<b>System Abbreviated Dial Forms</b>		<b>3-1</b>

**LIST OF TABLES**

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
3-1	Defining Personal Speed Dial Keys - SUPERSET <sup>®</sup> Set	3-2
3-2	Form 30 - System Abbreviated Dial Entry	3-2

**1. GENERAL**

**Introduction**

**1.01** This Section contains a description and instructions for using both Personal Speed Dial and System Abbreviated Dial. The Personal Speed Dial part contains the unique aspects of Speed Dial from SUPERSET<sup>®</sup> stations.

**Reason for Reissue**

**1.02** This Section is reissued to reflect Generic 1000 and Generic 1001 information for the SX-200<sup>®</sup> DIGITAL PABX.

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## 2. ABBREVIATED DIAL AND SPEED DIAL DESCRIPTION

### General

**2.01** Abbreviated Dial is a feature of the SX-200<sup>®</sup> DIGITAL PABX which allows the user to dial an abbreviated number in place of a longer external number. The longer number is substituted for the abbreviated number by the SX-200<sup>®</sup> DIGITAL PABX during Call Processing. The Abbreviated Dial feature requires the programming of tables either by the Attendant or during Customer Data Entry (CDE) in the case of System Abbreviated Dial, or by the station user in the case of Personal Speed Dial. The System Abbreviated Dial Assignment Form used by the Attendant can be found at the end of this Section. These tables are used to store Abbreviated Dial numbers consisting of access codes and all digits that must be dialed to obtain the desired party. For information regarding Attendant programming of System Abbreviated Dial numbers, refer to Section MITL9108-093-315-NA, Attendant Console Description.

### Personal Speed Dial Description

**2.02** This feature allows a SUPERSET<sup>®</sup> user to save a list of frequently called telephone numbers and to access these numbers by pressing a single key. Numbers are then outputted at a speed greater than when dialed in the usual manner. Numbers saved may be internal extensions, external local or long distance, external via tie lines, etc. Partial numbers may be entered to allow the user to complete a call by manually dialing some of the required digits.

**2.03** A validity check is not performed on the digits as they are stored, thus, any errors will only become evident during use of the Speed Dial feature. SUPERSET 4<sup>™</sup> users may verify their speed dial lists visually.

### System Abbreviated Dial Description

**2.04** System Abbreviated Dial allows a list of common, frequently called numbers to be saved and used on a systemwide basis. Access to the System Abbreviated Dial feature is controlled by Class Of Service, and these numbers are available to both SUPERSET<sup>®</sup> and standard telephone set users.

### System Tables

**2.05** System Abbreviated Dial or common-use tables possess the following characteristics:

- (a) Entries are programmed through the Attendant Console Abbreviated Dial function or through CDE. Refer to Section MITL9108-093-315-NA, Attendant Console Description, for further information.
- (b) Access is available to all station users.
- (c) Each entry can have up to 26 digits including special function digits.

## Abbreviated Dial

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- (d) A maximum of up to 1000 abbreviated dial entries may be assigned in the table (000-999).
- (e) Partial numbers, in which the user is required to dial digits manually, may be stored. When entered as part of a digit string, \*3 informs the system that manually dialed digits are expected. The number of digits to be manually dialed follows the \*3 command, and must be in the range 01 to 14. The terminator \*5 informs the system that the number is to be treated as an intercom number.

### System Abbreviated Dial Access

**2.06** The operations required to use the System Abbreviated Dial feature are as follows:

- Lift the handset (on the SUPERSET® set, the handsfree mode of operation may also be selected); dial tone should be heard.
- Dial the Abbreviated Dial number for the required directory number (access code plus 1- to 3-digit index number). For example, if the System Abbreviated Dial access code is 88, dial 88 plus the index number; e.g., 88 + 123.

**Note:** Reorder tone is returned if the index dialed is out of range or if there is no abbreviated dial number corresponding to the index dialed. Entry numbers may be dialed with or without leading zeros. For example, entry 0 will be interpreted as 000; entry 12 will be interpreted as 012. When leading zeros are omitted, the system waits a specified time-out period before interpreting the dialed digits.

### Personal Speed Dial Access

**2.07** The following are the operations required to make a call using the Speed Dial keys on a SUPERSET® set:

- Lift the handset or press the SPEAKER ON/OFF key or the appropriate Dial key (if programmed) for handsfree operation. Dial tone is heard.
- Press the appropriate Speed Dial key.
- The call is processed as a normally-dialed call.

**2.08** Any Class-of-Service restrictions applicable to the SUPERSET® set will still be enforced on a call dialed by using Speed Dial; a SUPERSET® set with a toll-restricted Class Of Restriction may not make a toll call by using the speed dial feature.



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### 3. PROGRAMMING

#### Personal Speed Dial

**3.01** The actions required to set up a Personal Speed Dial list are outlined in the following paragraphs. The SUPERSET 4™ user has a visual indication of the validity of any entry.

#### SUPERSET® Set

**3.02** The SUPERSET 4™ user may define up to 14 "speed call" keys, and the SUPERSET 3™ user may define up to 12 "speed call" keys, depending upon the number of line appearances on the set. The procedure for entering a Speed Dial number into the list is outlined in Table 3-1. This procedure will result in the deletion of any previously-programmed number associated with the selected key.

**3.03** If an error is made while entering the Speed Dial number, it may be corrected in one of two ways before pressing the SAVE feature key:

- (a) Press the ← feature key to backspace to and clear the error (SUPERSET 4™ set).
- (b) Press the EXIT feature key to cancel the entire entry.

**3.04** Partial numbers may be stored. When entered as part of a digit string, \*3 informs the system that manually dialed digits are expected. The number of digits to be manually dialed follows the \*3 command, and may be from 01 to 14 digits. The terminator \*5 informs the system that the number is to be treated as an intercom number. Refer to Section MITL9108-093-106-NA, SUPERSET 3™ Set Information, and Section MITL9108-093-107-NA, SUPERSET 4™ Set Information, for further details regarding Speed Dial.

#### System Abbreviated Dial Forms

**3.05** System Abbreviated Dial forms are used during the Customer Data Entry process. The System Abbreviated Dial Assignment form is shown in Table 3-2. System Abbreviated Dial numbers may be entered via the Attendant functions at the console if COS option 111 is enabled.



**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
TENANTING**

<b>CONTENTS</b>		<b>PAGE</b>
<b>1. INTRODUCTION</b>		<b>1-1</b>
Reason for Reissue		1-1
<b>2. GENERAL DESCRIPTION</b>		<b>2-1</b>
Overview		2-1
Independent Consoles, Trunks, and Stations		2-1
Tenant Interconnection		2-1
Identifying Tenants on Consoles and SUPERSET® Sets		2-2
Local Night Switching		2-4
Night Switching Control		2-4
Night Bells and Night Answer		2-4
"Dial 0" Routing		2-6
Call Rerouting Features and Answer Point		2-6
Direct Inward Dial Rerouting		2-7
Direct-In Line Rerouting		2-7
Numbering Plan		2-8
Automatic Route Selection with Multiple Tenants		2-8
Sub-Attendants and Message Centers		2-8
<b>3. PROGRAMMING AND CUSTOMER DATA ENTRY FOR TENANTING</b>		<b>3-1</b>
CDE Access Restrictions		3-1
Tenant Assignments		3-1
Interconnections Between Tenants		3-2
Call Rerouting		3-3
Night Switching		3-4

**LIST OF ILLUSTRATIONS**

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
2-1	Tenant Connections to PABX	2-2
2-2	Tenant Interconnection with Shared Console	2-3
2-3	SUPERSET 4™ Set Serving Several Tenants	2-5
2-4	Night Switching Options	2-6
2-5	"Dial 0" Call Routing	2-7

**LIST OF FORMS**

<b>FORM</b>	<b>TITLE</b>	<b>PAGE</b>
3-1	Stations/SUPERSET® Sets Programming Form	3-1
3-2	Tenant Interconnection Table	3-2
3-3	Call Rerouting Table	3-3
3-4	Tenant Night Switching Control	3-4

## 1. INTRODUCTION

**1.01** Tenanting is a feature which allows up to 25 tenants to share features and capabilities of the SX-200<sup>®</sup> DIGITAL PABX. PABX features are enabled for each tenant through CDE.

### **Reason for Reissue**

**1.02** This Section is reissued to describe tenanting and to explain how to use and program tenanting in an SX-200 DIGITAL<sup>®</sup> PABX with Generic 1000 or Generic 1001 software.

## 2. GENERAL DESCRIPTION

### Overview

**2.01** Tenanting is a very powerful and flexible feature available with the SX-200<sup>®</sup> DIGITAL PABX. A good understanding of tenanting coupled with a thorough analysis of the customer's requirements will enable the PABX to be installed in a most cost-effective manner. The customer (or customers) can share the economies of a larger PABX, such as specialized trunks, leased services, and other features. Station Message Detail Recording (SMDR), described in Section MITL9108-093-451-NA, allows equitable assessment of costs among all users.

**2.02** The SX-200<sup>®</sup> DIGITAL PABX allows up to 25 tenants (or customers) to be defined. The PABX may be operated as a single tenant, or in a multiple customer or multiple tenant mode, by sharing services such as attendants or trunks. A typical installation may have several tenants, each with its own trunks, stations and attendant. Members of different tenants may be programmed to access each other (but not necessarily each other's features) without going through the local Central Office, or may be totally independent of each other.

**2.03** A typical multiple tenant application is a company which occupies a large building and has attendants and/or sub-attendants in different areas, such as each floor or department. Some features, such as attendant recall, access the local attendant instead of the main attendant position, but other features such as WATS, ARS, Tie lines, or abbreviated dialing are available to all users.

**2.04** A typical multiple customer application is a building served by one PABX, with telephone service for each customer (tenant) going through the PABX independently. When one customer calls another, the calling party must access one of its CO trunks and dial the customer's listed directory number; the call will go through the CO and then appear as an incoming CO call at the called customer.

### Independent Consoles, Trunks, and Stations

**2.05** The PABX is divided into distinct tenants; all stations, SUPERSET<sup>®</sup> Sets, trunks, and attendant consoles are assigned to a tenant as they are programmed into the PABX. The PABX can have a maximum of 11 consoles. Trunks and "Dial 0" calls are programmed to ring to only their associated attendant position. Outgoing calls will seize only trunks within their same tenant, as shown in Figure 2-1.

### Tenant Interconnection

**2.06** The PABX may be programmed to allow certain tenants to connect to each other internally within the system or to allow for sharing of services such as an attendant console or trunks.

2.07 Each tenant may be allowed or not allowed to connect directly to any other tenant. For example, an attendant console to be shared by tenants 1, 2, and 3, can be assigned to tenant 25, and programmed to connect internally to tenants 1, 2, and 3; tenants 1, 2, and 3 may still be programmed to NOT connect to each other, as shown in Figure 2-2.

2.08 Note the special case when tenant 1 can call tenant 2 but tenant 2 cannot call tenant 1. If SUPERSET 4™ A in tenant 1 calls SUPERSET 4™ B in tenant 2, and upon receiving no answer, sends the message to call Set A, Set B can return the call to Set A (by pressing its MSG, READ MSG, and CALL softkeys) even though tenant 2 is normally restricted from calling tenant 1.

**Identifying Tenants on Consoles and SUPERSET® Sets**

2.09 Attendant consoles or SUPERSET® Sets may be programmed into one tenant that can provide a common answering point for incoming calls to all tenants, as well as calls that are unanswered by any tenant. Each tenant may not call the other tenants or access each other's trunks, but all of their calls will be directed to the common answering point. The incoming calls may be DID, DIL, or regular CO trunks.

2.10 When recalls are answered at a common answering point, the name of the tenant that did not answer is displayed as a NO ANSWER, so that the recall may be answered with an appropriate

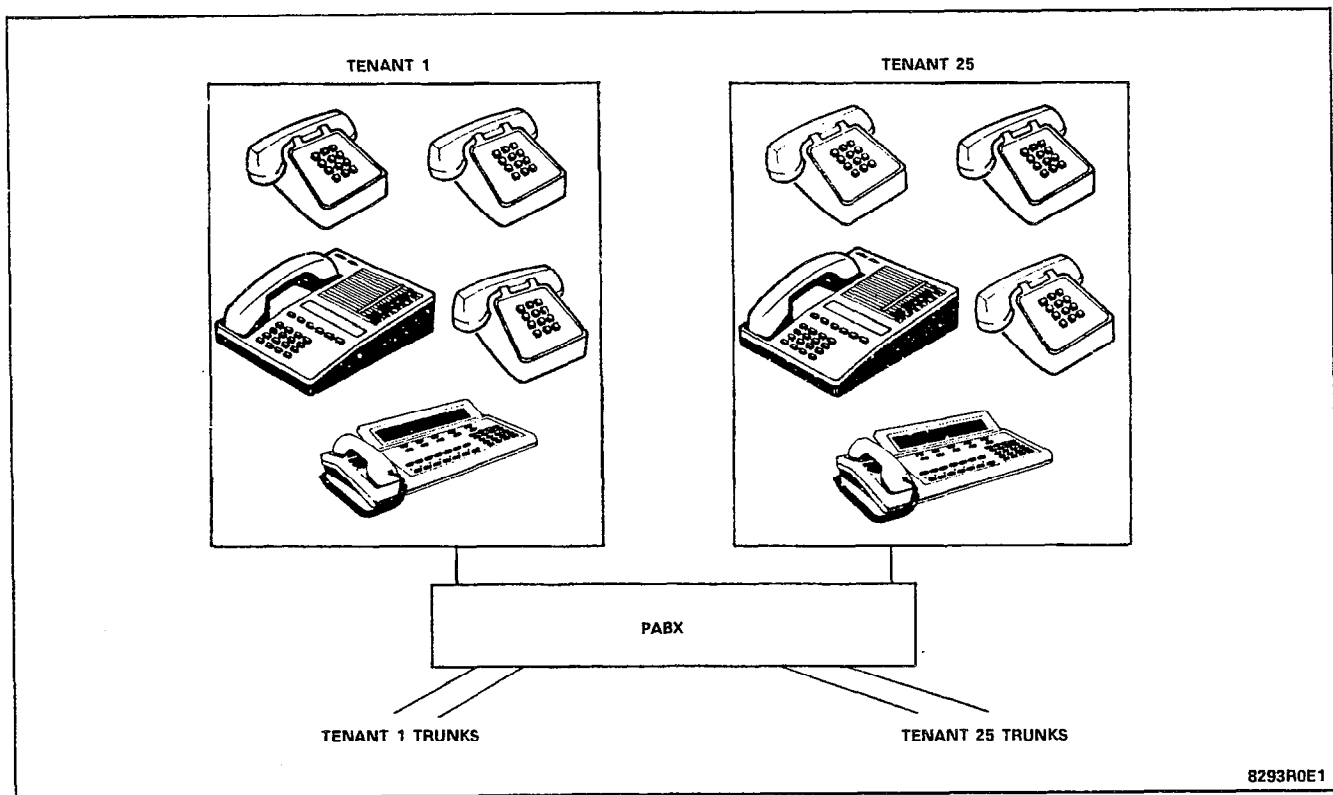
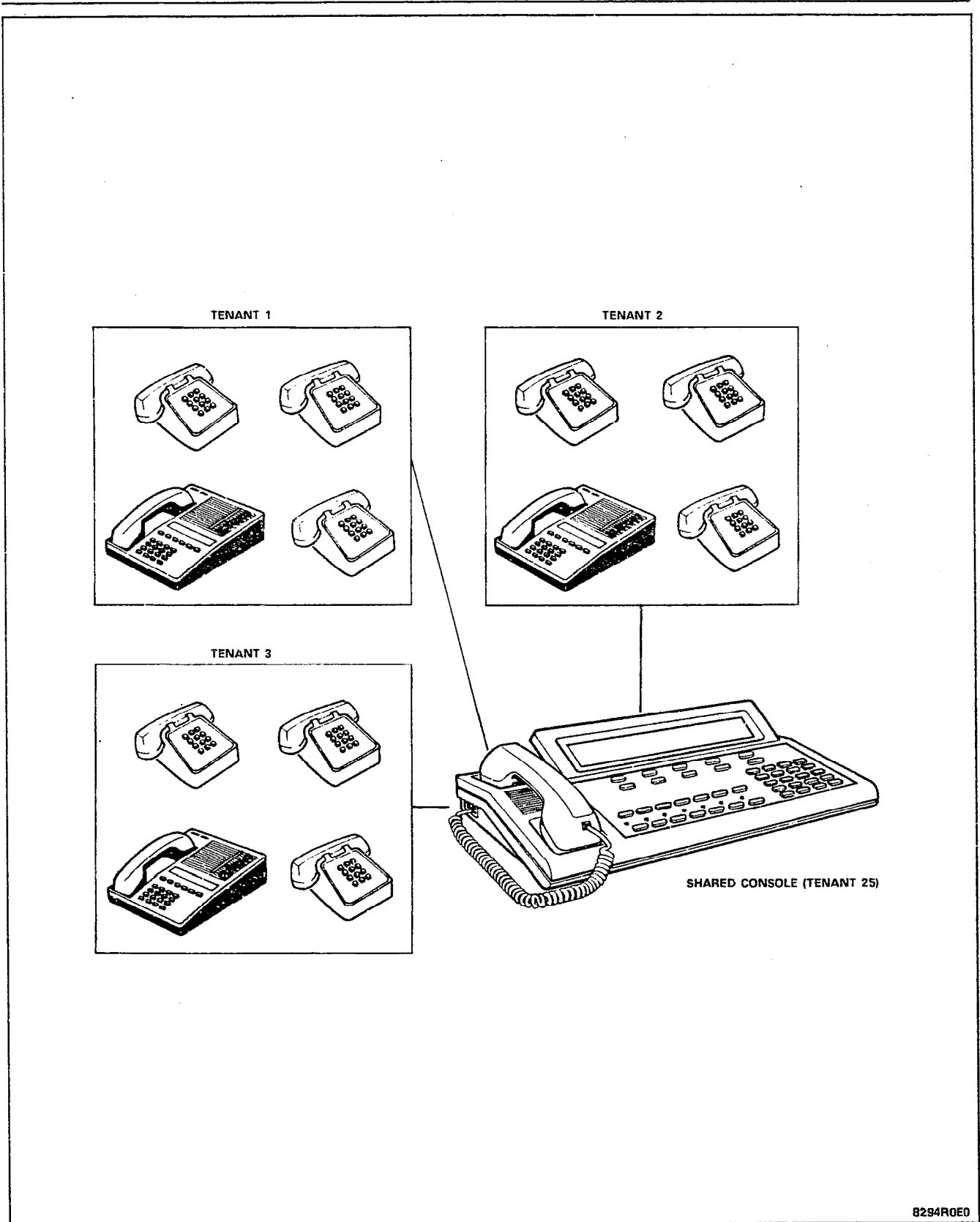


Figure 2-1 Tenant Connections to PABX



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Figure 2-2 Tenant Interconnection with Shared Console



response. If the called party has a SUPERSET 4™ Set, that party's name is displayed instead; however, the set may be programmed to display the company name instead.

**2.11** The call rerouting point for all tenants may be two SUPERSET 4™ Sets, with each tenant having its own key for recalls, as shown in Figure 2-3. A recall to a busy line will camp on to that line, allowing queuing for each tenant's recalls.

### Local Night Switching

**2.12** Tenants sharing the system may each require different system operation with respect to Day/Night mode. The PABX allows each tenant to switch into Night service independently, and to operate independently when it has switched to Night service. Figure 2-4 shows two typical examples.

**2.13** An attendant with a console may switch to Night 1 or Night 2 by pressing the FUNCTION key followed by the appropriate softkey.

**2.14** A tenant with a SUPERSET 4™ Set programmed as a sub-attendant may switch to Night service by pressing the SELECT FEATURES key and the softkey "NIGHT ANS" to toggle between Night 1 and Day service, either displaying "NIGHT SERVICE", or flashing "DAY SERVICE" and then reverting to time and date display, respectively.

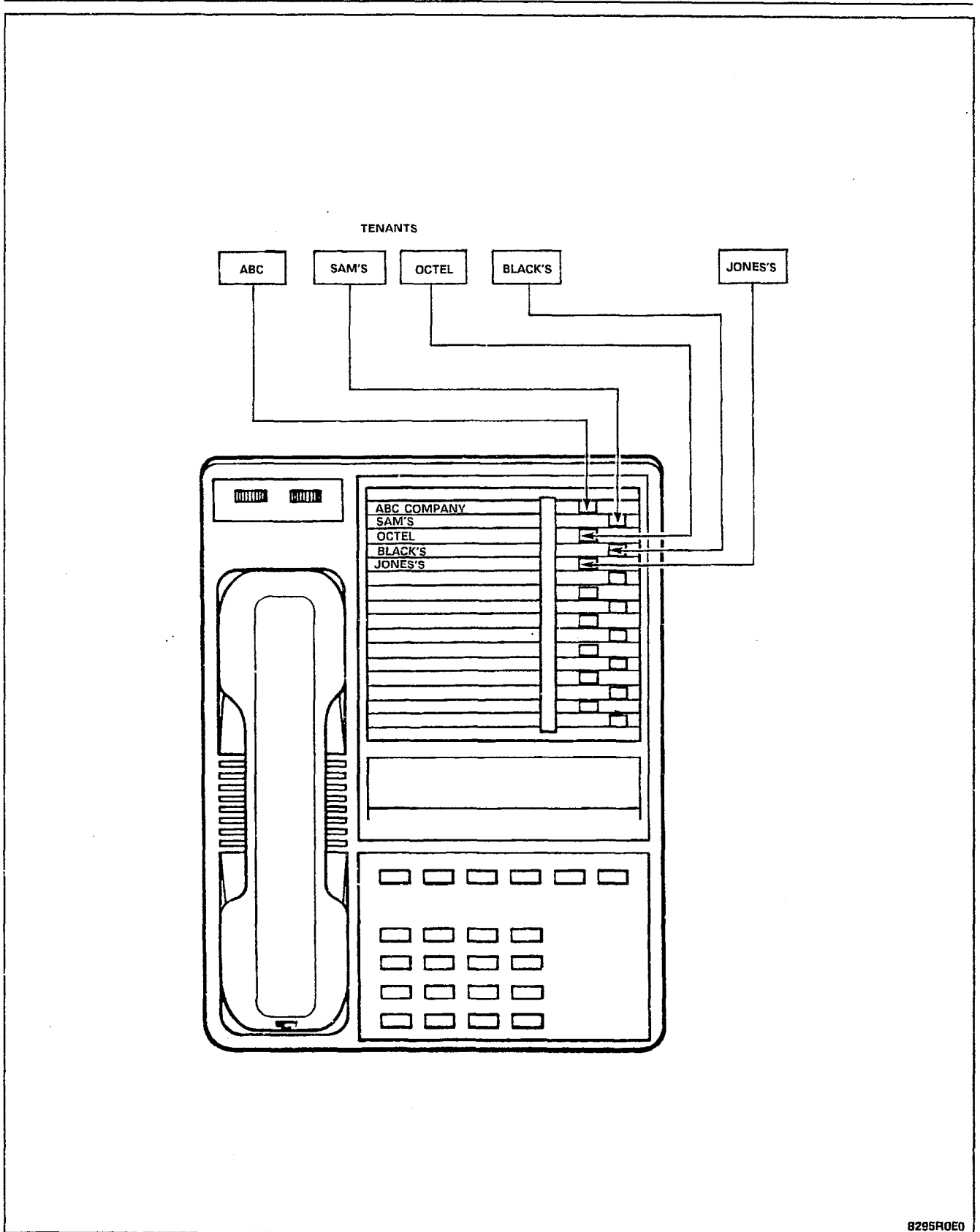
### Night Switching Control

**2.15** Each tenant may switch into Night service independently, from its console or sub-attendant SUPERSET 4™ Set. Since call rerouting destinations and incoming CO trunks are programmed for Day, Night 1, and Night 2, switching to Night service will automatically reroute all calls for that tenant.

**2.16** It may be desirable to have a console or SUPERSET 4™ Set (such as a night security desk) able to switch all tenants into Night 1 or Night 2 service. The security desk console may be programmed as a tenant that controls the Night status of tenants; when the security guard comes on duty and sets "Night 2", all associated tenants switch into Night 2. If a tenant forgot to switch to Night service, and calls were not being rerouted, the status will be corrected when the night security guard comes on duty and sets "Night 2" to reroute calls to the security desk.

### Night Bells and Night Answer

**2.17** The system allows incoming calls to be redirected to a Night bell. A station in that tenant may dial the "TAFAS ACCESS - LOCAL TENANT" feature access code to answer the first call in that tenant's queue. Similarly, the SUPERSET 4™ Set prompt "NIGHT ANS" will light if there is a call in its tenant queue. Any extension may dial the "TAFAS-any" feature access code to pick up a call in any tenant to which it is allowed to connect.



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Figure 2-3 SUPERSET 4™ Set Serving Several Tenants

**"Dial 0" Routing**

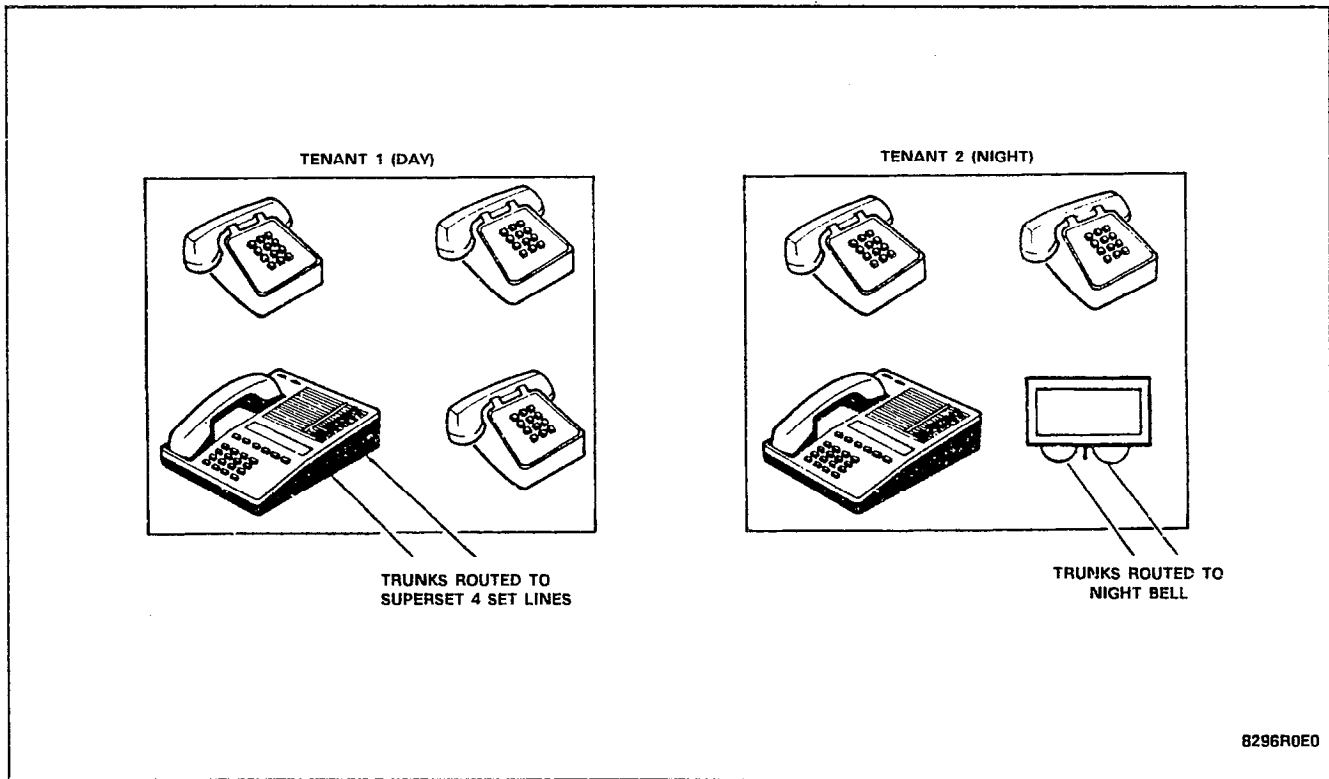
2.18 Any tenant group may operate with a central attendant position handling incoming calls and "Dial 0" calls, or may program its own Day/Night directory numbers to route "Dial 0" calls. Figure 2-5 shows two examples.

2.19 The feature access code for attendant access (usually "0") is programmed systemwide for all stations. Each tenant may then specify the Day, Night 1, and Night 2 answer points to route callers who dial this access code.

**Call Rerouting Features and Answer Point**

2.20 Each tenant may determine its method of rerouting "Dial 0" calls, intercepts for illegal access, or calls that are not answered, or reach busy parties. The answer point may be an Attendant console, SUPERSET® Set line, station, hunt group, or Night bell. The caller is automatically camped on to a busy station or SUPERSET® Set. Calls may also be routed to a staffed Night answering desk for the PABX, or to an outside answering service.

2.21 Rerouted calls arrive at a console as NO ANSWER or BUSY recalls. From the display, the attendant can identify which tenant originated the recall. Calls rerouted to a SUPERSET® Set may ring into a different key for each tenant, thereby identifying the company



**Figure 2-4 Night Switching Options**

that originated the recall. If the line is busy, a recall will automatically camp on to the SUPERSET® Set.

2.22 Several examples of Call Rerouting follow; a complete list is given in the CDE Section.

**Direct Inward Dial Rerouting**

2.23 In some cases DID trunks may be shared among tenants. The block of numbers obtained is used by all the tenants, each with its own phone numbers listed in the telephone directory. The DID trunks are placed into one tenant which is programmed to be able to connect to the other tenants that share the DID trunks. If no one answers an incoming call, or if the number is busy it may be rerouted to a specified answer point as a No Answer/Busy recall.

**Direct-In Line Rerouting**

2.24 Incoming DIL trunks are directed to ring destinations in any tenant that they can connect to. An unanswered incoming call may be rerouted to a specified answer point (Day, Night 1, or Night 2) as a No Answer recall, from the tenant into which the trunk rang.

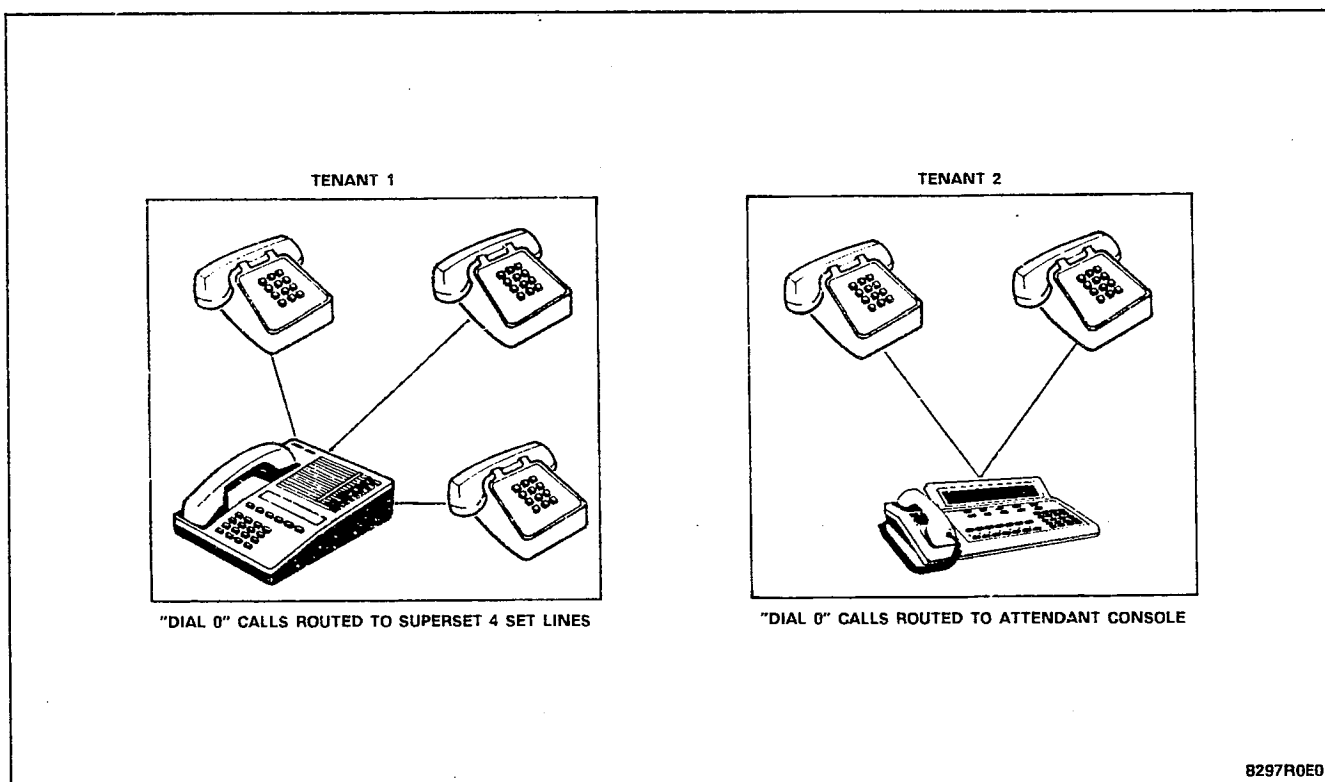


Figure 2-5 "Dial 0" Call Routing

### Numbering Plan

**2.25** Since tenants are allowed to connect to each other, numbers must be unique among all tenants, and must be nonconflicting across the entire system; for example, there may be one and ONLY ONE extension 201 in the PABX. Similarly, feature access codes must be the same throughout the system. SMDR records may be sorted for each tenant by its unique extension numbers.

### Automatic Route Selection with Multiple Tenants

**2.26** Automatic Route Selection (ARS) enables the system to access, in a specific sequence, possible routes to a given destination. Routes are listed within the system in the order in which they are to be tried.

**2.27** Route definition is based on trunk groups, each of which is listed as first to sixth choice to some destinations. Since some tenants may be allowed to access only specific trunks, the ARS package checks the tenant interconnection table to verify if a caller may access a particular trunk. If the first choice trunks are not available to a particular tenant, the system skips them and takes the next choice trunks instead. The system automatically searches available trunks from first choice to last choice as it attempts to find a free trunk.

**2.28** If tenant interconnection is allowed, shared trunks should be accessible from all participating tenants. ARS will optimize all calls made from these tenants. The administrator must collect and sort the SMDR reports for billing to each tenant.

### Sub-Attendants and Message Centers

**2.29** A company may set up its system with a main attendant console for receiving incoming calls and routing them to stations in the system. Usually the attendant who handled an incoming trunk call, receives the No Answer recall. Any department wanting to handle its own recalls (for example, to take messages), may program alternate recall points for its calls. The department is programmed as a tenant, and then uses call rerouting for its calls.

**2.30** The person can take a message and set message waiting on the absent party's set. Members of a department may call their own "message center" by dialing "0"; since each tenant programs its own dial "0" answering point, people don't have to remember how to call their message desk. They can call another department's message desk by dialing its extension number.

**3. PROGRAMMING AND CUSTOMER DATA ENTRY FOR TENANTING**

**3.01** This Part describes how the Customer Data Entry (CDE) package handles setting up the various functions described earlier. The forms are more fully explained in the CDE documentation in Section MITL9108-093-210-NA.

**CDE Access Restrictions**

**3.02** There are five levels of access to Customer Data Entry; Installer, Maintenance 1, Maintenance 2, Supervisor, and Attendant; access by each level is restricted during initial Customer Data Entry to prevent unauthorized database modifications.

**Tenant Assignments**

**3.03** Stations, sets, consoles, and trunks are assigned to a tenant when they are programmed into the system during CDE. The field labelled "TEN" is the tenant assignment field. Enter the tenant number (1-25) to which the station or SUPERSET® Set belongs. The STATION/SUPERSET® SETS programming form (Form 3-1) shows extension 4612 in tenant 1 and extension 1234 in tenant 2.

4:26 1-JAN-85

alarm status = NO ALARM

BAY	SLOT	CCT	TEN	EXT NUM	COS	COR	TYP	ANNOUNCE	BLF	COMMENTS
1	1	01	1	4612	1	1	Set			M. SMITH
1	1	02	2	1234	1	1	Set			J. DOE
1	1	03								
1	1	04								
1	1	05								
1	1	06								
1	1	07								
1	1	08								
1	2	01								
1	2	02								
1	2	03								
1	2	04								
1	1	01	1	4612	1	1	Set			M. SMITH
1-			2-FIND EXT		3-EXPAND SET		4-			5-RANGE
6-QUIT			7-BAY/SLT/CCT		8-DELETE		9-REVIEW			0-

**Interconnections Between Tenants**

**3.04** Each tenant may be allowed or not allowed to call any other tenant, by programming the TENANT INTERCONNECTION TABLE. On each horizontal line, an "\*" indicates tenants that may be called, and a "." indicates tenants that may not be called from that identified tenant.

**3.05** The diagonal of the matrix is labelled "O" because a tenant may not be prohibited from calling within itself. Note that the connection control is unidirectional; if tenant 1 may call into tenant 2, tenant 2 may not necessarily be able to call into tenant 1. This allows for a master tenant who could call everyone, but not be called.

**3.06** Form 3-2 shows an example where tenant 1 may call any tenant except tenants 5 and 7.

4:26 1-JAN-85

alarm status = NO ALARM

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01	O	*	*	*	.	*	.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05	.	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07	.	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08	*	*	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09	*	*	*	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10	*	*	*	*	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11	*	*	*	*	*	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12	*	*	*	*	*	*	*	*	*	*	*	O	*	*	*	*	*	*	*	*	*	*	*	*	*
01	O	*	*	*	.	*	.	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1-					2-				3-				4-TOP				5-BOTTOM								
6-QUIT				7-TENANT NUM				8-DISALLOW				9-				O-ENTER									

**Form 3-2 Tenant Interconnection Table**

**Call Rerouting**

**3.07** The CALL REROUTING TABLE (Form 3-3) specifies where each tenant is to route different types of calls in Day, Night 1, or Night 2. If no number is specified, the caller receives reorder tone.

**3.08** For dial-in and DID trunks, forwarding and intercepting is for calls that are dialed into the tenant currently being displayed. DID trunks, which can access multiple tenants, are routed by the tenant whose local directory number was dialed.

**3.09** Night bells and Attendant LDN keys are programmed into the system with directory numbers for reference, and may be specified here along with stations, SUPERSET® Sets, and SUPERSET® Set lines.

**TABLE 4-29  
FORM 19 - CALL REROUTING TABLE**

**CDE TERMINAL DISPLAY**

4:26 1-JUN-86

alarm status = NO ALARM

[TENANT : 1] TYPE OF CALL				DAY	N1	N2
Station Dial O Routing				1821	1821	
Priority Dial O Routing						
DID Recall Points On Busy						
DID Recall Points On No Answer						
DID Routing For Calls Into This Tenant						
DID Intercept Routing For Calls Into This Tenant						
DID Vacant Number Routing For This Tenant						
DID Attendant Night Access Points				-----		
Non-Dial-In Trunks Alternate Recall Points						
Dial-In Tie Recall Points On Busy						
Dial-In Tie Recall Points On No Answer						
Dial-In Tie Routing For Calls Into This Tenant						
Station Dial O Routing				1821	1821	
1-	2-	3-	4-TOP	5-BOTTOM		
6-QUIT	7-TENANT	8-	9-	0-		

**ATTENDANT CONSOLE DISPLAY**

[TENANT : 1] TYPE OF CALL				DAY	N1	N2
Station Dial O Routing				1821	1821	
F1>	F2>	F3>	F4>TOP	F5>BOTTOM		
F6>QUIT	F7>TENANT	F8>	F9>	F0>		



**Night Switching**

**3.10** A TENANT NIGHT SWITCHING CONTROL matrix allows one or more tenants (such as a night security desk console or SUPER-SET® Set) to switch all tenants into Night service. This matrix is similar to the TENANT INTERCONNECTION TABLE.

**3.11** The tenant being examined (horizontal row) will Night-switch each tenant programmed with an "\*" in its column. This matrix is unidirectional; tenant 1 may be programmed to Night-switch tenant 2, but tenant 2 may not be programmed to Night-switch tenant 1. Form 3-4 shows an example where tenant 1 will Night-switch all tenants into Night service, but all other tenants will only Night-switch themselves. Tenant 1 therefore is the "master tenant" for Night switching control.

4:26 1-JAN-85

alarm status = NO ALARM

	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
01	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
03	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
04	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
05	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
06	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
07	.	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
08	.	.	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
09	.	.	.	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	0	.	.	.	.	.	.	.	.	.	.	.	.	.
01	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
1-						2-					3-					4-TOP					5-BOTTOM				
6-QUIT					7-TENANT NUM					8-SWITCHED					9-					0-ENTER					

**Form 3-4 Tenant Night Switching Control**

**SX-200® DIGITAL  
PRIVATE AUTOMATIC BRANCH EXCHANGE (PABX)  
TRAFFIC MEASUREMENT**

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CONTENTS	PAGE
<b>1. GENERAL</b> .....	1-1
<b>Introduction</b> .....	1-1
<b>Reason for Reissue</b> .....	1-1
<b>Traffic Analysis</b> .....	1-1
<b>System Architecture</b> .....	1-1
<b>Data Demultiplexer</b> .....	1-2
<b>2. TRAFFIC MEASUREMENT METHODS</b> .....	2-1
<b>General</b> .....	2-1
<b>Types of Traffic Counts Accumulated</b> .....	2-1
<b>Register Count Examples</b> .....	2-5
<b>Power Failure</b> .....	2-6
<b>3. TRAFFIC MEASUREMENT COMMANDS</b> .....	3-1
<b>Maintenance Terminal and Console</b> .....	3-1
<b>Traffic Commands</b> .....	3-1
<b>4. INSTALLATION</b> .....	4-1
<b>General</b> .....	4-1
<b>Connection Requirements, Local Printer</b> .....	4-1
<b>5. REPORTS</b> .....	5-1
<b>Analyzing Traffic Reports</b> .....	5-6

## 1. GENERAL

### Introduction

**1.01** This Section describes principles of telephone traffic measurement for an SX-200<sup>®</sup> DIGITAL PABX, including programming and operating procedures for obtaining Traffic Measurement data.

### Reason for Reissue

**1.02** This Section is reissued to provide information about Traffic Measurement for the SX-200<sup>®</sup> DIGITAL PABX with Generic 1000 or Generic 1001 software.

### Traffic Analysis

**1.03** Traffic Analysis consists of two activities; the first is to collect data about the system (measurement), and the second is to interpret this data (analysis) to optimize performance. Once traffic measurement has been started in the PABX it continues automatically until changed or stopped. Traffic measurement produces only one report for the system, even if tenant service is provided.

**1.04** Traffic measurement accumulates data in the form of peg counts and usage over a specified period of time. A peg count is the total number of times a facility (device, service, or feature) is accessed irrespective of the length of each access; usage is the length of time or duration for which each facility is used. In certain applications the peak value of facility usage during the period is also recorded. Call holding time is the average length of each call.

$$\text{usage (Erlangs)} = \frac{\text{peg counts (per hour)} \times \text{call holding time (in seconds)}}{3600 \text{ (seconds per hour)}}$$

$$\text{usage (CCS)} = \frac{\text{peg counts (per hour)} \times \text{call holding time (in seconds)}}{100 \text{ (seconds per CCS period)}}$$

$$\text{usage (Erlangs)} = \frac{\text{usage (CCS)}}{36} \quad \text{or, 1 Erlang} = 36 \text{ CCS}$$

**1.05** Traffic measurement results may be examined to determine the adequacy of equipment provisioning, and the effectiveness of programmed options and features. Analyzing the results will identify changes which can be implemented by reprogramming and/or re-provisioning to improve system performance.

### System Architecture

**1.06** The SX-200<sup>®</sup> DIGITAL PABX is composed of several Bays connected together by Pulse Code Modulation (PCM) links. The system is controlled by a Main Control Card (MCC) which contains a circuit switch (MITEL DX chips) to connect any two ports within the system.

**1.07** There are four digital Bays (1, 2, 3, and 4) within the SX-200<sup>®</sup> DIGITAL 336-port configuration. A non-blocking digital link connects the MCC to Bays 1 and 2 in the Control shelf. Bays 3 and 4 are each connected to the MCC via a non-blocking PCM link.

**1.08** There are two digital Bays (1 and 2) and three analog Bays (3, 4, and 5) within the SX-200<sup>®</sup> DIGITAL 480-port configuration. A non-blocking digital link connects the MCC to Digital Bays 1 and 2 in the Control shelf. Each analog Bay is a peripheral shelf with 31 speech paths which connects to the MCC via a PCM link.

**1.09** If an extension connects from one Analog Bay to another Analog Bay, one speech path and PCM channel is used in each Bay (of 31 per Peripheral shelf). If an extension on an Analog Bay connects to another extension within the same bay, only one speech path is used. This feature is referred to as local switching since the speech path does not go to and return from the DX switch, but remains on only the local speech path within the Bay. Local switching applies only to Bays 3, 4 and 5. Calls between a Digital Bay and an Analog Bay occupy one speech path and PCM channel between the two bays. Calls within the Digital bays use the non-blocking PCM channels. To optimize traffic, trunks should be in the Digital Bays; trunks in the Analog Bays should be evenly distributed among the bays, and should preferably be outgoing.

### **Data Demultiplexer**

**1.10** 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. The Data Demultiplexer, MITEL Part Number 9160-000-001-NA (refer to Section MITL9160-080-300-NA), provides four separate outputs which may be routed as desired.

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## 2. TRAFFIC MEASUREMENT METHODS

### General

**2.01** Traffic measurement data is accumulated in periods of from 1 to 60 minutes in length. The start time, which is specified to the nearest minute, and the duration (required number of periods) identify the daily time when measurements are collected. These three parameters are entered from the console or maintenance terminal. Once set, traffic measurement will begin at the same time each day, and for the same duration until changed or stopped. The system clock times the length of each period; however, a guard timer also monitors each period and can terminate the period if it times-out before the system clock does. This would occur only if the system clock has been changed during a measurement period. The period length is not guaranteed if the clock is changed or the system is reset during a measurement period.

**2.02** Data is accumulated into active registers during each period; at the end of each period data is transferred to storage registers and the active registers are zeroed in preparation for receiving data from the next traffic measurement period. The data is held in these storage registers from which it may be printed or written to magnetic tape or a similar storage device. At the end of each period, the data in the storage registers is replaced by the data accumulated in the active registers during the period. If the data was not retrieved from the storage registers during a period, new data received at the end of that period overwrites the data, and it is lost. This sequence then repeats for the specified duration.

### Types of Traffic Counts Accumulated

**2.03** Two basic types of data are accumulated in the registers: peg counts and usage counts. Usage counts may be further divided into normal usage and maximum value counts, as outlined following:

**Peg Counts.** Each time a facility (device, service, or feature) is used, the Call Processing software increments its register by one count. A peg count is not concerned with the length of time of usage.

**Usage Count.** The amount of time for which a facility is used may be calculated from the usage count. At 10 second intervals, the Call Processing software scans each facility and increments the register if it is in use. The usage count is directly proportional to the time that a circuit is in use. Each accumulated usage count is converted into ccs or Erlangs for the Report. The maximum usage is 6553.50 ccs or 182.04 Erlangs; this could only occur if 182 devices in a facility are all busy for 1 hour. The consoles are scanned every second for accuracy in the average waiting time for an answered call.

**Maximum Value Count.** This type of count is obtained similar to that above, except that the value obtained at each scan does not increment the register; instead it is compared with the register's value and updates the register only if its value exceeds that in the register. This

value reflects the scanned maximum count of the usage of a resource. Since this is a scanned value it is possible that a busy peg may exist without the maximum count reaching the number available.

**Number Of Records For Each Group.** The number of system, feature, receiver, and channel pegs is fixed for each system. The number of console, trunk group, and trunk pegs can vary; at the beginning of each period, records are allocated for consoles, trunk groups, and trunks. Each console and trunk group that is programmed in CDE is allocated one record. The programmed trunks are allocated the remaining records, in ascending trunk number order. In Generic 1000, 84 records are allocated; in Generic 1001, 112 records are allocated.

Example:

System configuration:	For Generic 1000 the following traffic would be recorded:	For Generic 1001 the following traffic would be recorded:
- 4 consoles	- 4 consoles	- 4 consoles
- 15 trunk groups	- 15 trunk groups	- 15 trunk groups
- 70 trunks numbered 1 to 70	- 65 trunks numbered 1 to 65	- 70 trunks numbered 1 to 70
89 devices (total)	84 records (total)	89 records (total)
		23 records still available

**2.04** The following data is accumulated during traffic measurement:

System Activity - indicates the extent of activity on the basic system  
- maximum peg count = 65535

1 s Dial Tone: This is incremented every time that an extension or dial-in trunk has to wait 1 or more seconds for dial tone.

2 s Dial Tone: This is incremented every time that an extension or dial-in trunk has to wait 2 or more seconds for dial tone.

3 s Dial Tone: This is incremented every time that an extension or dial-in trunk has to wait 3 or more seconds for dial tone.

Console Calls: Count of all calls directed to any console including calls that hang up before they are answered.

Console orig.: Count of all console originations.

Dial 0 Calls: Count of all dial 0 calls that are answered at any console. This includes internal calls as well as priority dial 0 calls.

Ext origin.: 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.

Intercepted: Count of all intercepted calls that are answered at all consoles.

---

Recall:	Count of all console-answered recalls.
Activity:	Each time a device has activity, this count is incremented.
Illegal Calls:	Whenever an extension, console or dial-in trunk dials a vacant or illegal number.

**Features** - indicates the activity of those features which have been programmed for the installation.  
 - maximum peg count = 65535

Callback:	Count of callbacks that have been setup.
Call forward:	Count of all call forwarding setups at any extension or console.
Call hold:	Count of number of hard holds by an extension.
Call park:	Count of number of call parks.
Call pickup:	Count of legally dialed call pickups, includes local pickups or directed pickups from extensions.
Camp-on:	Count of camp-ons for extension-to-trunk, extension-to-extension, and trunk-to-extension.
Console conf.:	Count of the number of times consoles use the conference softkey.
Console hold:	Count of the number of all console call holds.
DND:	Count of do not disturb setups.
Ext. conf.:	Count of extension conferences.
Flash Hold:	Count of transfers or flash and holds from an extension or console.
Guest Room:	Count of Guest Room softkey depressions.
Hold pickup:	Count of successful hold pickups (calls held at the console in a hold slot and picked up using the dialed console and hold slot number).
Msg Waiting:	Count of applied message waiting.
Override:	Count of completed busy overrides.
Paging:	Count of successful pager accesses.
Serial Call:	Count of console serial calls.
TAFAS:	Count of TAFAS (night answer) answered from dialed feature access code or Set softkey.
Wake-Up:	Count of call wake-up setups.

**DTMF Receivers** - records activity on receivers within system  
 - maximum peg = 65535



Peg:	Represents the total number of times that the DTMF receivers were accessed during the measurement period.
Usage:	Represents the total usage (Erlangs or CCS) for the DTMF receivers during the measurement period. Does not include busied-out receivers (maximum = 6553.5 ccs).
Busy Peg:	Represents the number of times a call could not be allocated a DTMF receiver immediately due to busy conditions.
Maximum in use/ Available:	The scanned maximum count of the number of receivers in use during the period and the number that are available for use. Does not include busied-out receivers.

**Channel Usage And Local Switching** – records activity between Bays and within each Peripheral Bay

Bay Number:	Identifies Bay for which data is being accumulated.
Channel Usage:	Usage of channels available to the Bay. Does not include channels allocated for music or tones (maximum = 6553.5 ccs).
Max Channel/ Available:	The scanned maximum number of channels in use and the number available for use. Does not include channels allocated for music or tones.
Local Switching Usage:	Usage of peripheral bay local switching (maximum = 6553.5 ccs).
Max Local Switching:	The scanned maximum number of local switches found in a peripheral bay.

**Console** – records activity of each console on the system

Console Number:	Directory number of the console. The console directory number is determined at the time of the report. If this console had been deleted, it will display ??? indicating that the directory number could not be determined.
Usage:	Non-idle use of the console. The console is non-idle when it is using a channel. The console is idle when it is ringing, using the application key, or using the select features key (maximum = 36 ccs).
Call Waiting Usage:	Usage of the Console queue when calls cannot be immediately answered (maximum = 655.35 ccs).
Calls Answered:	Calls answered using the console. Includes softkey and ANSWER key answers (maximum peg count = 65535).

**Avg Waiting Time:** Average waiting time for a call to the console to be answered.

**Hunt Groups** – records activity of each hunt group

**Hunt Group Number:** Programmed hunt group number.

**Peg:** Number of accesses to hunt group, including busy attempts (maximum = 65535).

**Usage:** Usage of all devices in the hunt group (maximum = 6553.5 ccs).

**Busy Peg:** Number of times the hunt group was busy.

**Max in use/Available:** Scanned maximum number of devices in the hunt group that were busy; busied-out devices are not included.

**Trunk Groups** – records activity of each trunk group

**Trunk Group Number:** Programmed trunk group number.

**Peg:** Number of accesses to trunk group, including busy attempts (maximum = 65535).

**Usage:** Usage of all trunks in the trunk group making outgoing calls, measured in CCS or Erlangs (maximum = 6553.5 ccs).

**Busy Peg:** Number of times the trunk group was busy (maximum = 255).

**Max in use/Available:** Scanned maximum number of trunks in the trunk group that were busy; busied-out trunks are not included. The number of available trunks in a trunk group is determined at the time of the report and is not in the storage registers.

**Trunks** – records activity of each trunk during the measurement period

**Trunk Number:** List of all trunk numbers that were accessed.

**Peg in:** Total number of times the trunk was seized by incoming calls on the trunk (maximum = 255).

**Usage In:** Represents the usage (in Erlangs or CCS) for incoming calls on the trunk (maximum = 36 ccs).

**Peg Out:** Total number of times the trunk was seized by an outgoing call on the trunk (maximum = 255).

**Usage Out:** Represents the usage (in Erlangs or CCS) for outgoing calls on the trunk (maximum = 36 ccs).

### Register Count Examples

**2.05** A call which lasts for 100 seconds has a value of 1 ccs (hundred-call-seconds). One Erlang equals 36 ccs (3600 call seconds). Usage is measured in 10-second units; for example, a usage

## Traffic Measurement

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count of 128 (128 x 10 s) represents 1280 seconds of usage, equivalent to 12.8 ccs or 0.3556 Erlang (36 ccs equals 1 Erlang). The following example illustrates these "count" methods.

**Extension Originations Peg Count** - Each time an idle extension goes off-hook, it causes the register to increment by one count. Since it is a measure of the number of calls originated by the extensions, it does not increment when a ringing extension goes off-hook to answer a call. For example, if this register has a value of 858, the number of call originations (or off-hook originations) during the period totalled 858.

**Trunk Group Usage** - Each time the system scans the members of this trunk group, at 10 second intervals, it counts the number of members that are busy. A register value of 273 indicates that members were busy for  $273 \times 10 = 2730$  seconds (27.3 ccs) during the measurement period.

### Power Failure

**2.06** If power fails to the system, the current traffic measurement will be lost, and the latest traffic report will also be lost if it had not been output. When power is restored, traffic measurements will restart, and continue until the end of the scheduled period. This period's start time will be the time of the power-up.

**3. TRAFFIC MEASUREMENT COMMANDS**

**Maintenance Terminal and Console**

**3.01** The maintenance terminal or console is used to enter the data required to start traffic measurements, print measurements, monitor status, or change traffic measurement parameters. Refer to Section MITL9108-093-351-NA, RS-232 Maintenance Terminal for instructions on using the terminal. At the maintenance terminal or console, select the MAINTENANCE application; from the MAINTENANCE main menu, select TRAFFIC MEAS (softkey 5).

**Traffic Commands**

SET	SHOW	PRINT	READ	
QUIT			STOP	

- SET - Set traffic report information
- SHOW - Status of current traffic report, contains information defined by the SET command.
- PRINT - Print the latest report
- READ - Read latest traffic report
- STOP - Stop current traffic measurements or stop printing report

**SET Command**

UNITS	PERIOD	DURATION	AUTOPRINT	CANCEL
	START TIME	CONDENSED		

- UNITS - CCS or ERLANGS
- PERIOD - 1 to 60 minutes
- DURATION - number of periods
- CONDENSED - Condensed report ON or OFF
- CANCEL - Quit SET commands
- START TIME - hh:mm
- AUTOPRINT - Automatically print after each period

Use the SET command to enter or change any traffic measurement parameters; use the prompts to change the required data and then exit from the TRAFFIC MEAS function. Once the START command is issued, the PERIOD and DURATION cannot be changed for the current traffic measurements. The AUTOPRINT, and CONDENSED parameters can be changed while it is running. At the beginning of each period of current traffic measurement, the pegs and the dynamic records are initialized. If a new trunk group was set up by CDE, it would not be included in the traffic report until the next period. The START command cannot be issued while traffic measurement is on; it must be STOPped and then

## Traffic Measurement

---

restarted.

**STOP Command** – This command causes two softkeys to become active, and pressing either selects what is to be stopped.

**TRAFFRPT** – stops the traffic measurement currently active. No report will be made of the incomplete collected data.

**PRINT** – stops a printout being sent to the PRINTER port.

**Note:** The STOP command will not stop an AUTOPRINT in progress; the AUTOPRINT command must be set to OFF between printouts to stop printouts.

**SHOW STATUS Command** Contains a summary report on the current traffic measurement parameters.

STATUS : Activated/OFF  
DATA COLLECTION : Running/OFF  
START TIME : hh:mm  
DURATION : nn periods  
PERIOD : mm minutes  
UNITS : erlangs/ccs  
AUTOPRINT : ON/OFF  
CONDENSED : ON/OFF

START TIME and DATA COLLECTION are not displayed if STATUS is OFF.

**DATA COLLECTION** This indicates that data is currently being collected (if it is running). When it is OFF, either the daily start time has not been reached, or, it has finished the required number of periods since the start time; in either case, no data is currently being collected.

**PRINT** This softkey command causes the latest traffic report held in the system to be immediately printed.

**READ** This softkey command causes the latest traffic report in the system to be displayed on the maintenance terminal, where it may be read by the user. READ is only available at the Maintenance Terminal. If the Console softkey is pressed, the following message appears on the LCD display:

**This function is not available for this device.**

**QUIT** This softkey command allows the user to exit from Traffic Measurement mode at the console or terminal.

## 4. INSTALLATION

### General

- 4.01** Installation to meet the Traffic Measurement requirements consists of the following steps:
1. Determine the required traffic parameters
  2. Determine the required output device
  3. Install the output device
  4. Program the traffic parameters and output device for this installation.

### Connection Requirements, Local Printer

**4.02** Section MITL9108-093-200-NA details the installation of SX-200<sup>®</sup> DIGITAL PABX systems; also refer to Section MITL9108-093-351-NA, RS-232 Maintenance Terminal, and reference System Set Commands which assign printers during installation and initial maintenance programming. The Traffic Measurement data may be output to a printer, magnetic recording device, or the maintenance terminal. If required, a Data Demultiplexer may be used and the Traffic Measurement data directed to one output of it.

**4.03** When a local printer is used, it should be located as near as possible to the PABX, and connected to the PABX data port with a 25-conductor connectorized cable, not longer than 4.5 m (15 ft) in length.

5. REPORTS

5.01 The standard report provides a printed report of the data in the storage registers (usually the measurements taken during the preceding period). The report includes headings which make the data easy to read. Three typical reports are printed following:

SX-200/G1000 TRAFFIC REPORT  
6-DEC-85  
11:20 to 12:20

SYSTEM ACTIVITY:

1s dial tone	0	2s dial tone	0	3s dial tone	0
Console calls	6	Console orig.	4	Dial 0 calls	5
Ext. origin.	34	Intercepted	0	Recall	1
Activity	126	Illegal calls	0		

FEATURES:

CallBack	1	Call hold	0	Call Forward	1
Call Pickup	2	Campon	3	Console conf.	0
Console hold	2	DND	0	Ext. conf.	2
Flash hold	6	Hold pickup	0	Msg Waiting	1
Override	0	Paging	1	Serial call	0
TAFAS	0				

DTMF RECEIVERS:

Peg	Usage	Busy Peg	Max/Avl
1	0.01 ccs	0	1/ 4

CHANNELS:

Bay	Usage	Max/Avl	Local Usage	Max local
1	3.30 ccs	6/126		
2	0.00 ccs	0/ 63		
3	6.10 ccs	5/ 31	0.00 ccs	0
4	0.00 ccs	0/ 31	0.00 ccs	0
5	0.00 ccs	0/ 31	0.00 ccs	0

CONSOLE:

Directory Number	Usage	Calls Answered	Calls Waiting Usage	Avg. Waiting Time (sec)
1821	0.60 ccs	1	0.05 ccs	5.00
1841	0.00 ccs	0	0.00 ccs	0.00
2321	0.00 ccs	0	0.00 ccs	0.00
2341	0.00 ccs	0	0.00 ccs	0.00

TRUNK GROUPS:

Number	Peg	Usage	Busy Peg	Max/Avl
1	6	0.90 ccs	0	1/ 1
2	9	1.60 ccs	3	1/ 1
6	11	1.04 ccs	1	2/ 2
7	0	0.00 ccs	0	0/ 1
8	0	0.00 ccs	0	0/ 0

TRUNKS:

Number	Peg In	Usage In	Peg Out	Usage Out
1	3	0.80 ccs	6	0.90 ccs
4	4	0.70 ccs	3	0.50 ccs
8	6	0.50 ccs	6	1.10 ccs
9	5	0.60 ccs	11	1.04 ccs
10	3	0.20 ccs	0	0.00 ccs

SX-200 DIGITAL Generic 1001 336P/B39 TRAFFIC REPORT  
 SYSTEM 253  
 25-APR-86  
 13:45 TO 14:05

SYSTEM ACTIVITY:

1s dial tone	5	2s dial tone	0	3s dial tone	0
Console calls	35	Console orig.	28	Dial 0 calls	32
Ext. origin.	175	Intercepted	0	Recall	2
Activity	2803	Illegal calls	1		

FEATURES:

CallBack	1	Call hold	9	Call Forward	5
Call Park	0	Call Pickup	1	Campon	13
Console conf.	11	Console hold	9	DND	11
Ext. conf.	5	Flash hold	31	Guest Room	20
Hold pickup	3	Maid in Room	5	Msg Waiting	7
Override	6	Paging	13	Serial Call	13
TAFAS	4	Wakeup	11		

DTMF RECEIVERS:

Peg	Usage	Busy Peg	Max/Avl
218	6.70 ccs	5	3/ 4

CHANNELS:

Bay	Usage	Max/Avl	Local Usage	Max local
1	2.20 ccs	124		
2	9.60 ccs	4/ 62		
3	33.00 ccs	6/ 94		
4	41.20 ccs	5/ 94		

CONSOLE:

Directory	Usage	Calls	Calls Waiting	Avg. Waiting
Number		Answered	Usage	Time (sec)
2321	1.05 ccs	36	2.56 ccs	7.11

HUNT GROUPS:

Number	Peg	Usage	Busy Peg	Max/Avl
1	34	0.30 ccs	21	1/ 2
2	8	14.30 ccs	3	2/ 2

TRUNK GROUPS:

Number	Peg	Usage	Busy Peg	Max/Avl
1	33	2.80 ccs	0	3/ 6
2	21	1.50 ccs	0	3/ 5
6	8	1.30 ccs	0	3/ 4
7	0	0.00 ccs	0	0/ 0
8	38	0.00 ccs	38	0/ 0



SX-200 DIGITAL Generic 1001 336P/B39 TRAFFIC REPORT  
 SYSTEM 253  
 25-APR-86  
 13:45 to 14:05 (CONT'D)

TRUNKS:

Number	Peg In	Usage In	Peg Out	Usage Out
100	0	0.00 ccs	5	0.50 ccs
101	0	0.00 ccs	5	0.30 ccs
102	0	0.00 ccs	6	0.60 ccs
103	0	0.00 ccs	6	0.40 ccs
104	0	0.00 ccs	6	0.50 ccs
105	0	0.00 ccs	5	0.40 ccs
120	5	1.50 ccs	4	0.40 ccs
121	4	1.70 ccs	5	0.40 ccs
122	11	1.30 ccs	4	0.20 ccs
123	10	1.70 ccs	4	0.30 ccs
124	11	1.50 ccs	4	0.20 ccs
125	0	0.00 ccs	0	0.00 ccs
130	0	0.00 ccs	0	0.00 ccs
131	0	0.00 ccs	2	0.40 ccs
132	0	0.00 ccs	2	0.20 ccs
133	0	0.00 ccs	2	0.50 ccs
134	0	0.00 ccs	2	0.00 ccs
150	0	0.00 ccs	0	0.00 ccs
151	0	0.00 ccs	0	0.00 ccs
190	0	0.00 ccs	0	0.00 ccs

SX-200 DIGITAL Generic 1001 480P/B39 TRAFFIC REPORT  
 SYSTEM 253  
 25-APR-86  
 13:45 TO 14:05

SYSTEM ACTIVITY:

1s dial tone	5	2s dial tone	0	3s dial tone	0
Console calls	35	Console orig.	28	Dial 0 calls	32
Ext. origin.	175	Intercepted	0	Recall	2
Activity	2803	Illegal calls	1		

FEATURES:

CallBack	1	Call hold	9	Call Forward	5
Call Park	0	Call Pickup	1	Campon	13
Console conf.	11	Console hold	9	DND	11
Ext. conf.	5	Flash hold	31	Guest Room	20
Hold pickup	3	Maid in Room	5	Msg Waiting	7
Override	6	Paging	13	Serial Call	13
TAFAS	4	Wakeup	11		

DTMF RECEIVERS:

Peg	Usage	Busy Peg	Max/Avl
218	6.70 ccs	5	3/ 4

CHANNELS:

Bay	Usage	Max/Avl	Local Usage	Max local
1	2.20 ccs	124		
2	9.60 ccs	4/ 62		
3	3.00 ccs	1/ 31	0.00 ccs	0
4	1.20 ccs	3/ 31	0.00 ccs	0
5	18.10 ccs	6/ 31	1.80 ccs	2

CONSOLE:

Directory	Usage	Calls	Calls Waiting	Avg. Waiting
Number		Answered	Usage	Time (sec)
2321	1.05 ccs	36	2.56 ccs	7.11

HUNT GROUPS:

Number	Peg	Usage	Busy Peg	Max/Avl
1	34	0.30 ccs	21	1/ 2
2	8	14.30 ccs	3	2/ 2

TRUNK GROUPS:

Number	Peg	Usage	Busy Peg	Max/Avl
1	33	2.80 ccs	0	3/ 6
2	21	1.50 ccs	0	3/ 5
6	8	1.30 ccs	0	3/ 4
7	0	0.00 ccs	0	0/ 0
8	38	0.00 ccs	38	0/ 0

SX-200 DIGITAL Generic 1001 480P/B39 TRAFFIC REPORT  
 SYSTEM 253  
 25-APR-86  
 13:45 to 14:05 (CONT'D)

TRUNKS:

Number	Peg In	Usage In	Peg Out	Usage Out
100	0	0.00 ccs	5	0.50 ccs
101	0	0.00 ccs	5	0.30 ccs
102	0	0.00 ccs	6	0.60 ccs
103	0	0.00 ccs	6	0.40 ccs
104	0	0.00 ccs	6	0.50 ccs
105	0	0.00 ccs	5	0.40 ccs
120	5	1.50 ccs	4	0.40 ccs
121	4	1.70 ccs	5	0.40 ccs
122	11	1.30 ccs	4	0.20 ccs
123	10	1.70 ccs	4	0.30 ccs
124	11	1.50 ccs	4	0.20 ccs
125	0	0.00 ccs	0	0.00 ccs
130	0	0.00 ccs	0	0.00 ccs
131	0	0.00 ccs	2	0.40 ccs
132	0	0.00 ccs	2	0.20 ccs
133	0	0.00 ccs	2	0.50 ccs
134	0	0.00 ccs	2	0.00 ccs
150	0	0.00 ccs	0	0.00 ccs
151	0	0.00 ccs	0	0.00 ccs
190	0	0.00 ccs	0	0.00 ccs

5.02 The condensed report contains the data only, in decimal form. Register numbers and assignments are known for each particular software Generic. The dynamic section of the report requires a header for each group of data and the device number beside the device data. A program which analyses the data knows the format in which the condensed report is structured, and can interpret the data accordingly.

**Analyzing Traffic Reports**

5.03 From reading the Traffic Report, the following total traffic values can be determined.

Total Traffic = Sum of channel usage - Receiver usage  
Number of Calls = Extension Originations + Console Originations + sum of incoming trunk pegs

5.04 The following table lists typical business traffic:

<u>Traffic Type</u>	<u>Number of Ports</u>	<u>Traffic/Port(CCS)</u>	<u>Total CCS</u>
Light	250	1.4	350
	300	1.4	420
	350	1.4	490
	400	1.4	560
	480	1.4	672
Medium	250	3.0	750
	300	2.9	870
	350	2.9	1015
	400	2.9	1160
	480	2.9	1392
Heavy	250	5.5	1375
	300	5.4	1620
	350	5.4	1890
	400	5.4	2160
	480	5.4	2592